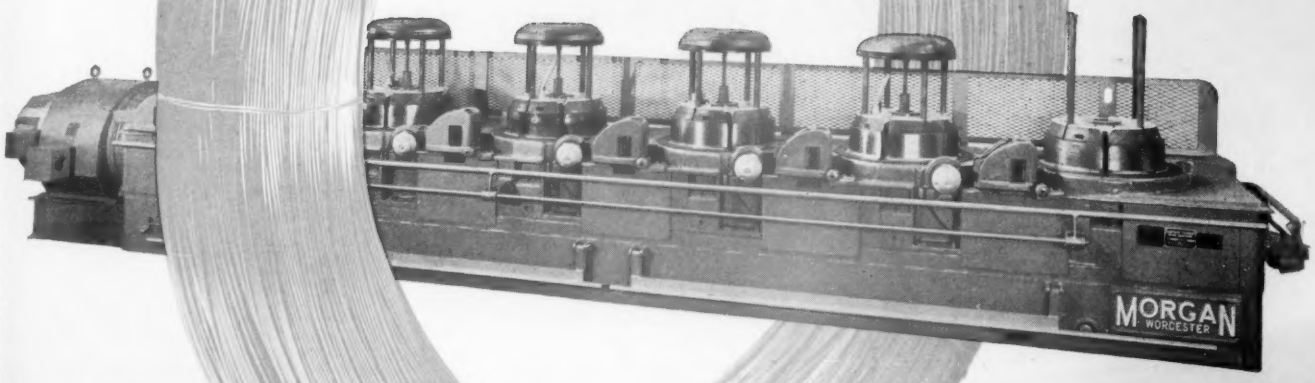
WIRE AND WIRE PRODUCTS

AUGUST 195

MORGAN-CONNOR
WIRE DRAWING MACHINES



HIGH PRODUCTION
SUPERIOR RESULTS

MORGAN WORCESTER

MORGAN CONSTRUCTION COMPANY
WORCESTER, MASSACHUSETTS

WM102

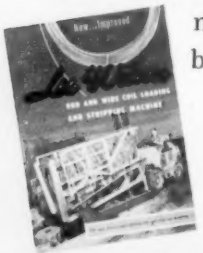
FFICIAL PUBLICATION OF THE WIRE ASSOCIATION

Here's a wire and rod handling system ...that works!

ONE MAN OPERATION—*A ram truck laying stack of coils in trough of new Lee Wilson Hydraulic Machine.*

New, improved Lee Wilson Loading and Stripping machine— proved to cut handling costs...

Handling of wire and rod coils at the annealing station has always been an awkward and time consuming job. Many makeshift devices have been tried to reduce handling costs. Lee Wilson engineers, concerned with all aspects of modern annealing practice, have developed a hydraulic machine that really works. Rod and wire coils can be loaded or stripped by one man in a matter of seconds. Here's cost saving you'll want to know more about. Write today for your copy of the new brochure, or contact your Wilson sales engineer.



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Lee Wilson* **ENGINEERING COMPANY, INC.**
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MAKE THE BEST METALS BETTER

STANDARD INDUSTRIAL COMPOUNDS CO.

has completed its First year in its new building (shown above).

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UNIFORM DRUM WEIGHTS ------ **to simplify receiving and inventory.**
BATCH CONTROL NUMBERS ---- **to maintain quality and uniformity.**
RETAINED SAMPLES ---------- **to compare and check each shipment.**
UP-TO-DATE LABORATORY ------- **to develop new products.**
MODERN EQUIPMENT ---------- **to produce better products.**

These and many others are the reasons why modern and progressive wire mills patronize *"Standard"* for *"America's Finest Wire Draw"*.

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Standard Industrial
COMPOUNDS CO., INC.

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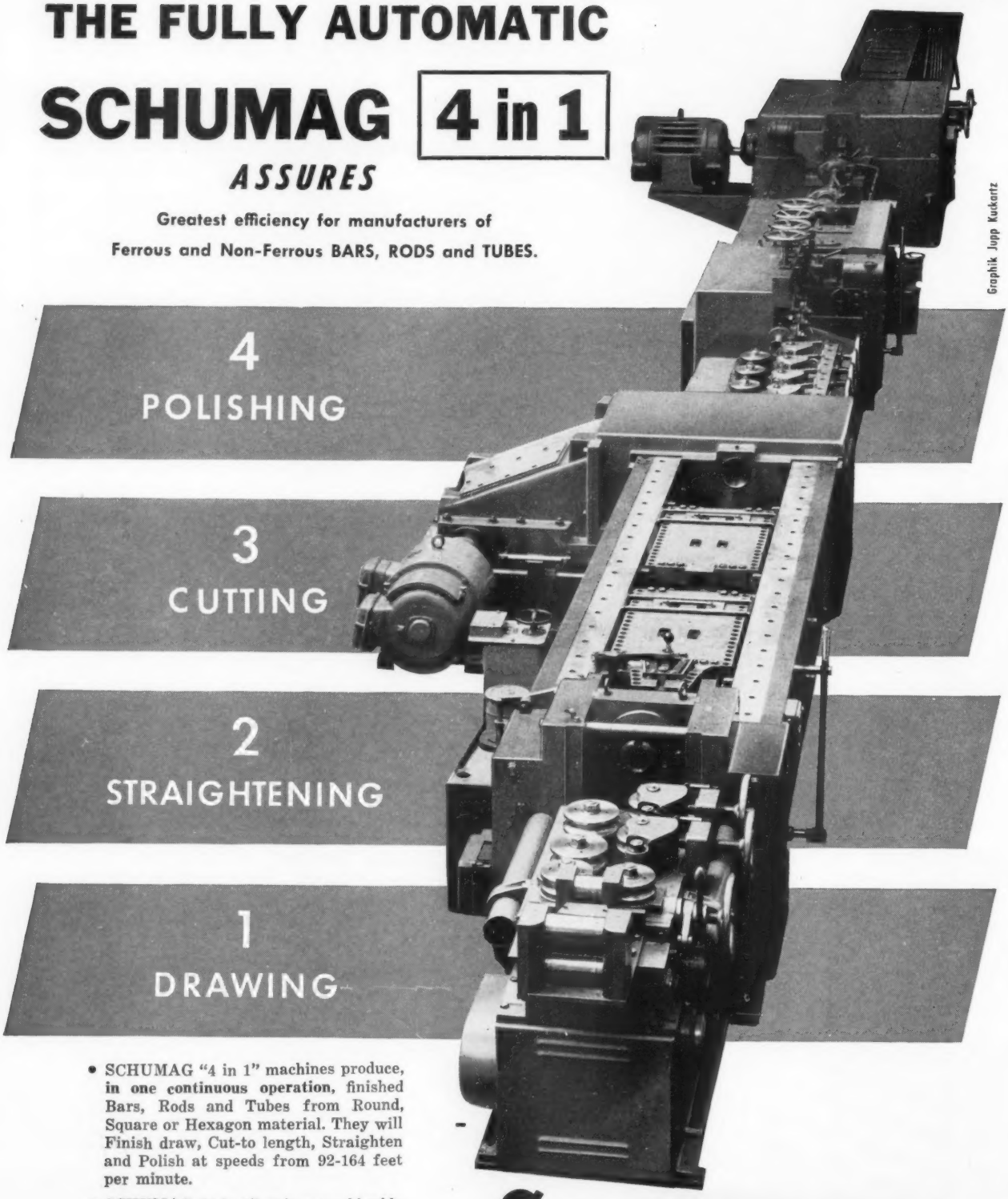
Telephones: 2131-2141

THE FULLY AUTOMATIC

SCHUMAG 4 in 1

ASSURES

Greatest efficiency for manufacturers of
Ferrous and Non-Ferrous BARS, RODS and TUBES.



Graphik Jupp Kuckartz

- SCHUMAG "4 in 1" machines produce, **in one continuous operation,** finished Bars, Rods and Tubes from Round, Square or Hexagon material. They will Finish draw, Cut-to length, Straighten and Polish at speeds from 92-164 feet per minute.
- SCHUMAG "4 in 1" enjoys world-wide reputation as the **ultimate** in technical development.

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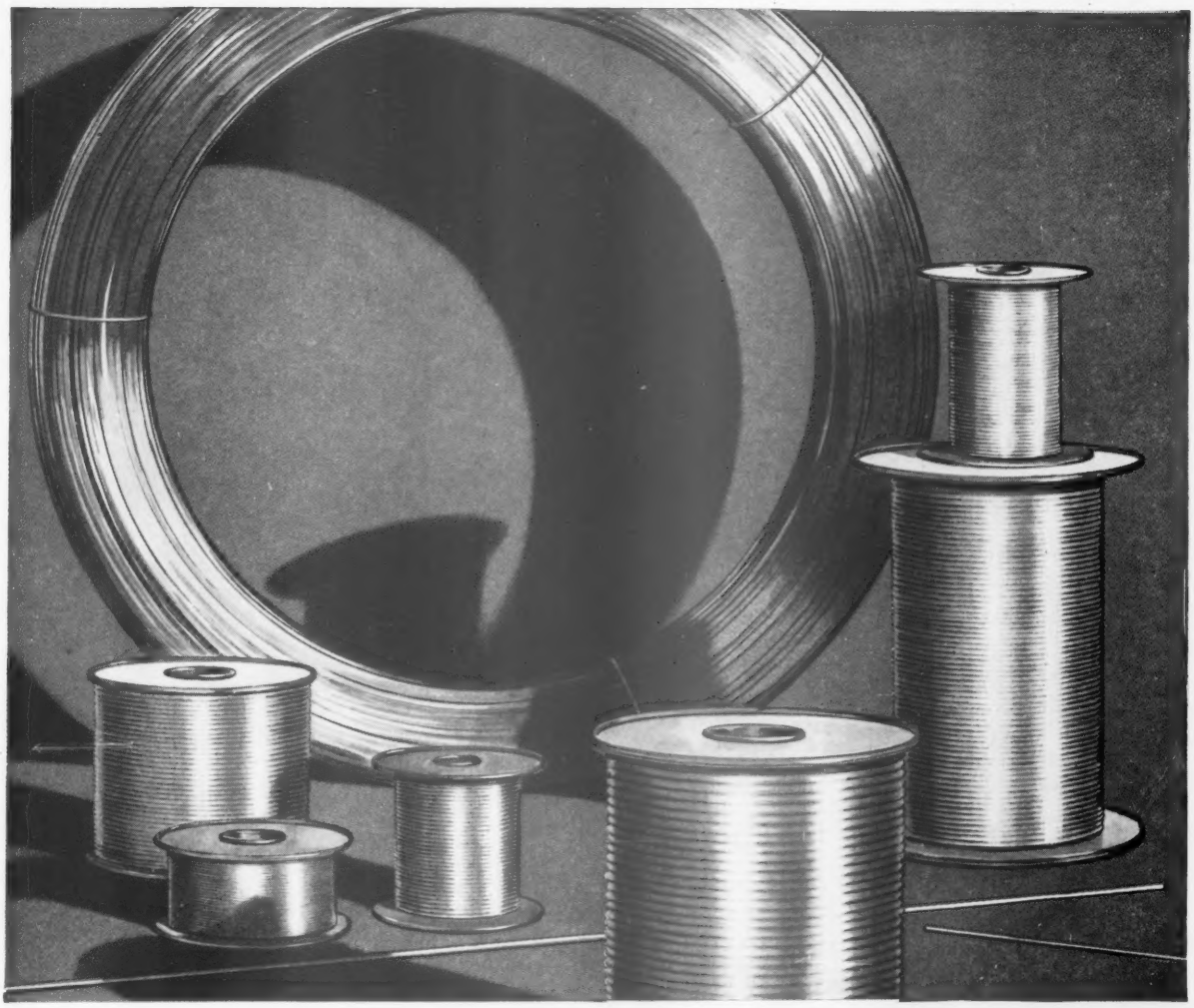
AMERICAN LAUBSCHER CORPORATION Fisk Bldg., 250 West 57th Street, New York 19, N. Y.



what CRUCIBLE offers stainless wire users . . .

Fuller Selection — Name the type of stainless wire you want and it will be available at Crucible, in the right grade and size. That's true whether you use cold heading, fine, spring, or shape wire. And Crucible stainless wire can be had in a variety of finishes, including bright and several metallic and nonmetallic coatings—full hard to dead soft—centerless ground or polished.

Specialty Mill Quality — You can be *sure* of Crucible quality, for we control every step of production from ore to furnace, to rolling of slabs and billets, to final wire drawing. What's more, Crucible is one of the largest producers of stainless for *all* applications.

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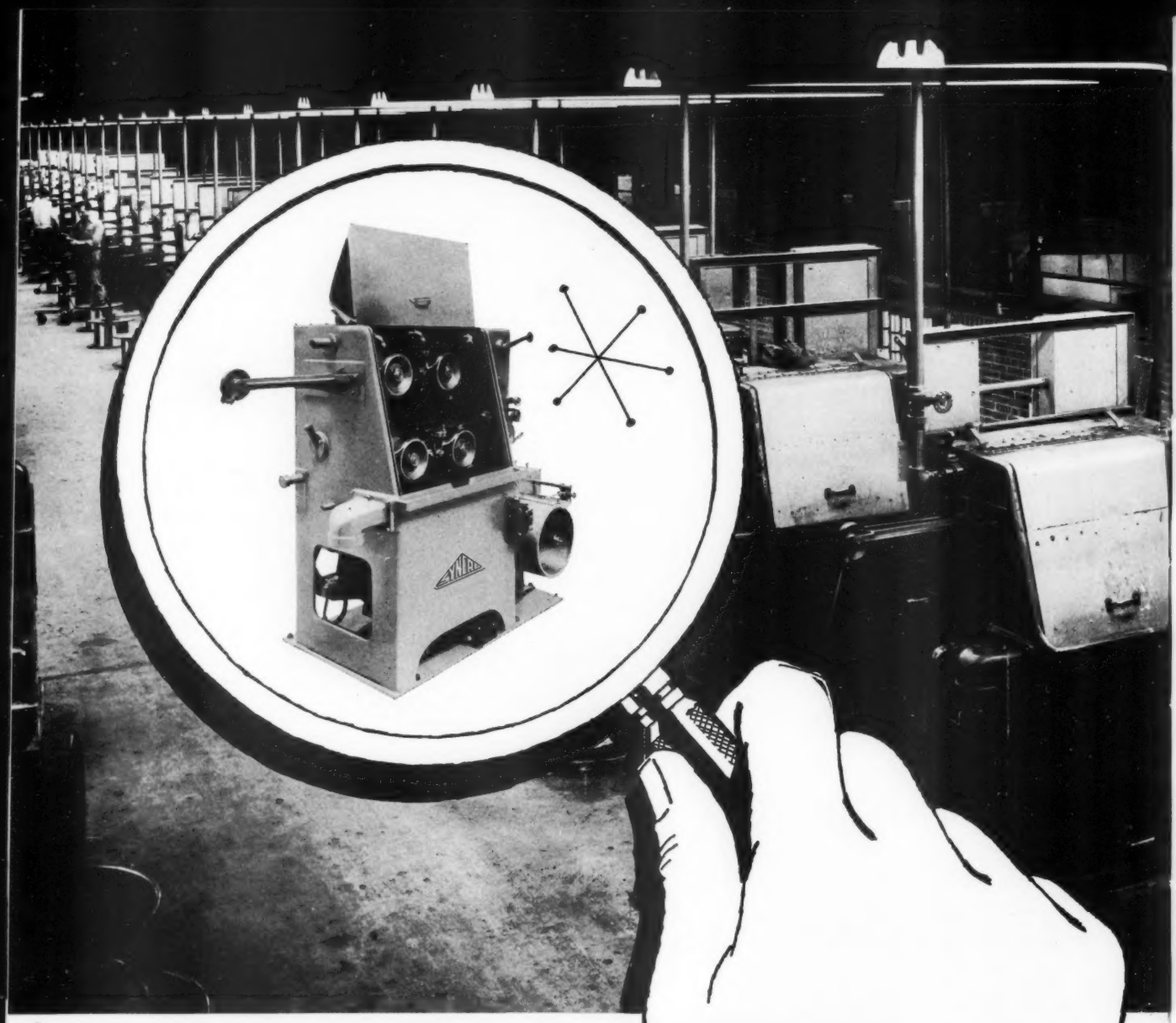
Dependable Delivery — Your nearby Crucible representative can either supply your needs from warehouse stocks, or arrange for prompt mill deliveries. You'll be dealing with a *steelman* qualified to offer sound, practical advice on wire and wire applications, if you ask him for it. And he's backed by the technical service of the nation's largest specialty steel organization. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

For more information, write now for a copy of "Rezistal Stainless Steel Wire." It's a 32-page booklet packed with useful data.

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

Canadian Distributor — Railway & Power Engineering Corp., Ltd.



MAGNIFY WIRE DRAWING PROFITS . . .

More than ever, successful competition demands cutting production costs. And today, as always, Syncro wire drawing machinery proves to industry that top performance magnifies profits. Syncro brings the B-16 Fine Wire Drawing Machine into focus with production-proved facts:

- 5000 FPM operation • Minimum slip guarantees Maximum block and die life
- Spooler speed transmission assures uniform wire speed throughout the entire spool • Full spool automatic shut-down switches.

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WIRE AND WIRE PRODUCTS*

Reg. U. S. Pat. Off.

A monthly publication devoted to the production of Wire, Rod and Strip, Wire and Rod Products and Insulated Wire and Cable.

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 32 August, 1957 No. 8

Designated as Official Publication By The Wire Association

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— ASSOCIATE EDITORS —
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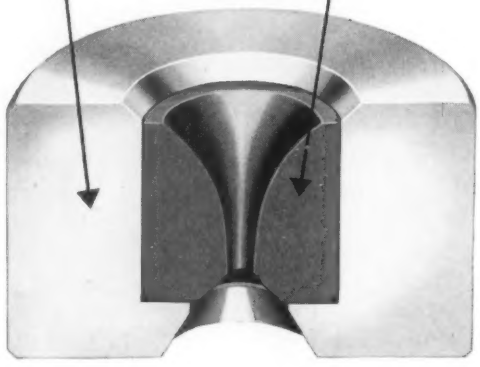
SAME HIGH-QUALITY
CARBIDE DIE NIBS



NEW LOWER PRICES

SAVE 20% ON THIS R-10 DIE. And make similar savings on other Carboloy dies, mandrels, and nibs. Get improved casings, same high-quality carbide.

NEW MANUFACTURING PROCESS BRINGS REDUCED PRICES ON CARBOLOY® DIES

All Carboloy wire dies are now made on a new mechanized manufacturing line. As a direct result of this mechanization, prices of all round-hole dies have been reduced approximately 20%.

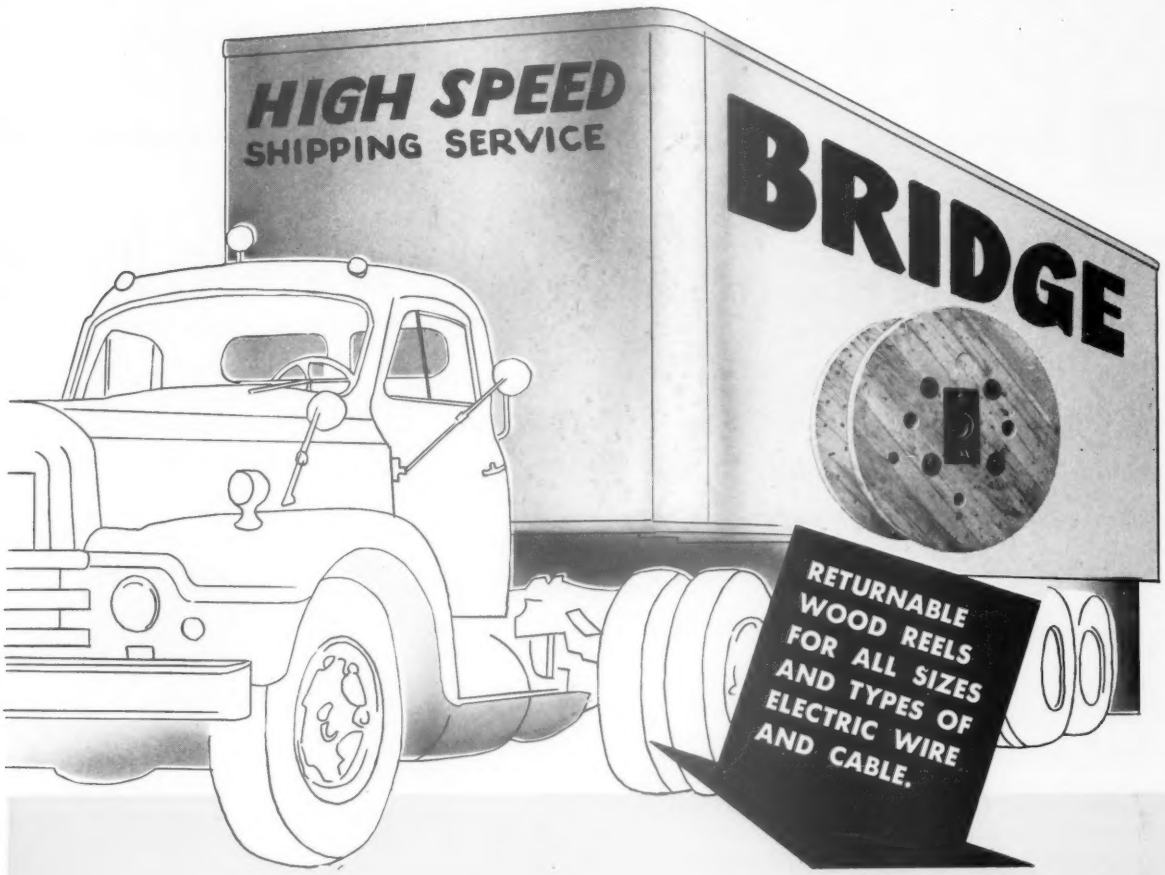
The carbide in these dies is the same tough, wear-resistant grade that has set record after record in mills throughout the country. But the carbide is now encased by a new technique in heat-treated, cold-drawn steel that is of consistently high quality.

The savings created by mechanization have been passed along to you. Price reductions on Carboloy cemented carbide round-, square-, and hex-shape dies will bring you substantial savings. And standard header die nibs, mandrels, and nail gripper nibs carry even greater reductions.

These savings are more proof that our continuing program of product and process improvement is paying off for our customers in lower manufacturing costs. For your copy of the new Price List D-138 on standard Carboloy dies, write: *Metallurgical Products Department of General Electric Company, 11171 E. 8 Mile Street, Detroit 32, Michigan.*

Progress Is Our Most Important Product

GENERAL ELECTRIC

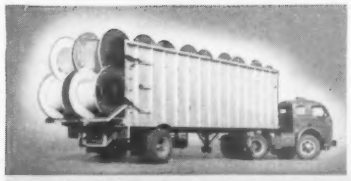


EVERY TYPE OF WOOD REEL—

Returnable or Non-Returnable for the WIRE INDUSTRY . . . from 10" to 10' in diameter.

STRAIGHT LINE production methods produce accurately-made REELS of HIGHEST QUALITY at prices that make it good business to buy from BRIDGE.

A completely MODERN plant, with the very FINEST and FASTEST equipment, much of it specially designed for BRIDGE, assures you of rapid SERVICE and STRONG SERVICEABLE REELS.



HIGH SPEED
SHIPPING SERVICE IN OUR OWN TRUCKS

within a radius of 200 miles from the plant. Fast freight will bring you Bridge reels within a few days east of the Mississippi.

RETURNABLE REELS ARE BUILT TO PROVIDE MANY TRIPS WITHOUT REPAIRS.

"REEL GOOD . . .

Let us quote on your reel needs. Send us your specifications. Better yet, visit our plant and see how and why Bridge reels are made so well at so low a cost.

WOOD REELS"

Improved-quality extrusions at faster rates with

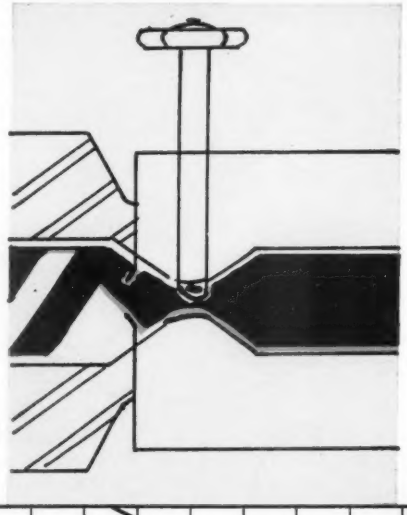
new "controlled pressure" extrusion technique

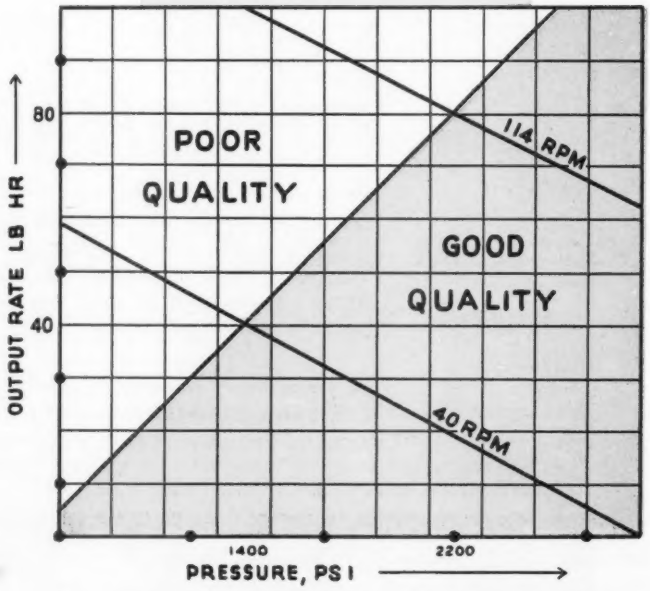
Experiments have shown that extrusion quality is related to three primary factors—pressure, resin temperature, and extrusion rate. A change in any one of these factors affects one or both of the others.

Now, Bakelite Company Laboratories have developed an efficient, accurate method of controlling pressure during the extrusion operation. Essentially, it employs a valve between the extruder head and the die, together with a pressure gauge and an immersion thermocouple in the head, or between the head and the valve.

This process provides a continuous method of control. Proper manipulation of pressure and screw speed results in better temperature control and improved resin homogeneity, better mixing characteristics and an improved product at increased output.

The development of this controlled-pressure (valve) extrusion by Bakelite Company permits operation of all extruders at their maximum capacity while maintaining highest quality.





The above graph on a typical sample run gives dramatic evidence of the effect of the controlled pressure (valve) extrusion technique on output. Without the valve, the highest usable screw speed, giving commercially acceptable quality, was 40 rpm. This resulted in an output rate of 40 pounds per hour or 100 feet per minute (Point A) When the streamlined controlled pressure valve was used, the screw speed could be increased to 114 rpm, *DOUBLING* the acceptable-quality production rate (Point B).

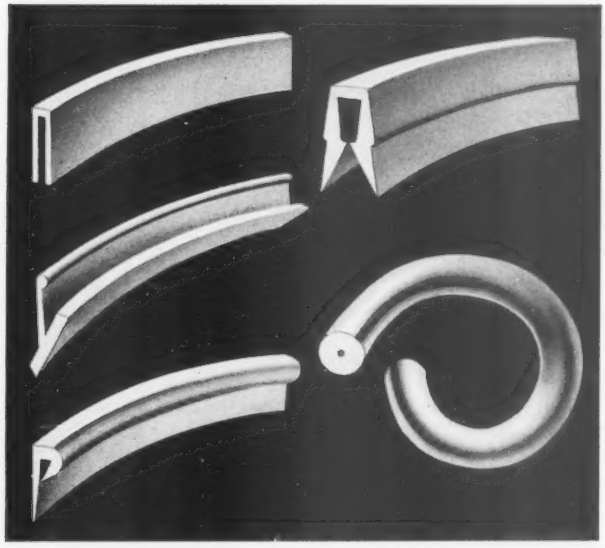
The values used in the above figure are the result of one sample test run under a typical set of extrusion conditions and should not be applied empirically to other extrusion conditions. Conditions used in this test were as follows: two inch extruder using a dry blend electrical compound based on QYRS extruded on number 14 wire with a wall thickness of 1/32 inch. Improved extrusion results, similar to those shown for wire and cable, may be expected for other applications.

new BAKELITE BRAND dry-blend Vinyl Resin QYRS

Controlled pressure (valve) extrusion permits the extrusion of dry-blend resin comparable in quality to the extrusion of hot-flux materials. When used with BAKELITE Brand Vinyl QYRS, it results in a superior product with improved finish, reduced roughness, and minimum "fisheyes".

Advantages of QYRS include the following:

High bulk density of 30-35 lbs./sq. ft., permitting larger tonnage output rates from a given size blender.



QYRS is desirable for preblend formulations used in both electrical and non-electrical applications. It is particularly suitable for building wire, flexible cord, appliance wire, telephone wire, power cable, and such contour extruded items as garden hose, welting, and belting.

High specific viscosity of 0.205 to 0.220, resulting in improved physical properties, such as strength.

More uniform particle size, ensuring maximum extrusion rate, minimum dusting, and proper dispersion of plasticizer with resin.

Batch-to-batch uniformity, assuring uniform extrusions.

Faster dry blending time, based on tests that prove QYRS will dry blend 10-15% faster than conventional resins while still maintaining excellent dispersion of ingredients.

Utilization of present cycle, so that fabricators can use the same blending cycle as presently employed with other dry-blending resins.

Adaptability to a shorter cycle as a result of faster plasticizer absorption.

For further information on the controlled pressure (valve) extrusion method and the new BAKELITE Brand dry-blend vinyl resin QYRS, write Dept. Z-196.

BAKELITE BRAND PLASTICS

UNION CARBIDE

BAKELITE COMPANY, *Division of Union Carbide Corporation,* 30 East 42nd Street, New York 17, N. Y.

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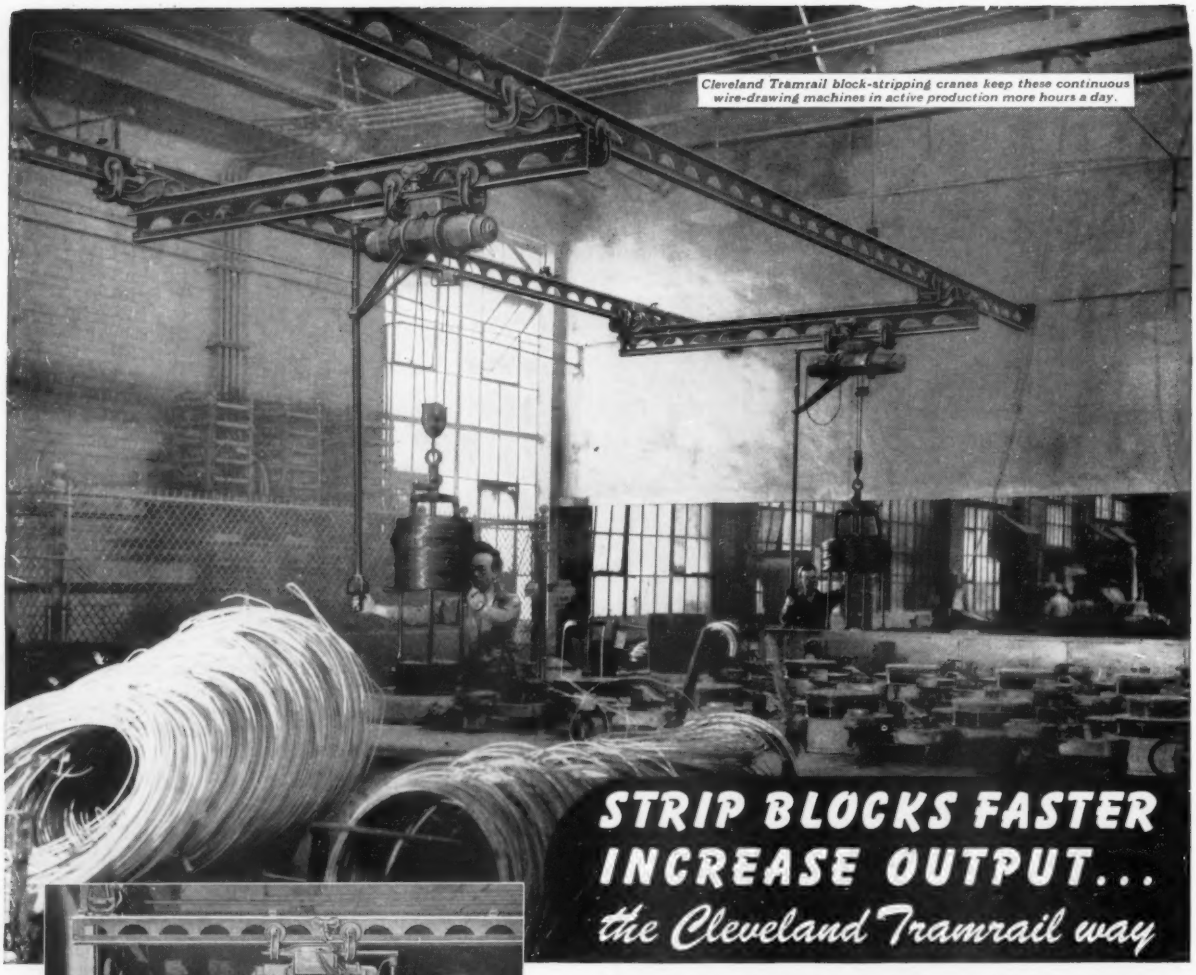
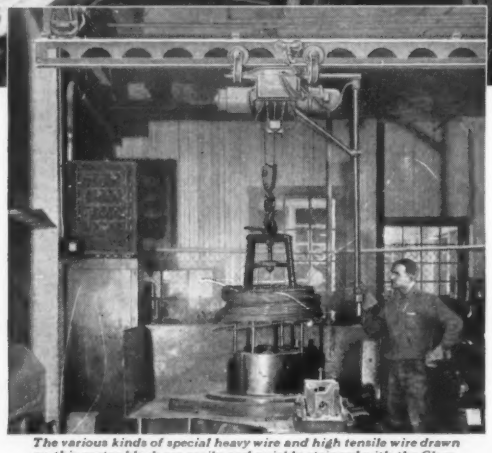


Cleveland Tramrail block-stripping cranes keep these continuous wire-drawing machines in active production more hours a day.

STRIP BLOCKS FASTER INCREASE OUTPUT...

the Cleveland Tramrail way



The various kinds of special heavy wire and high tensile wire drawn on this motor block are easily and quickly stripped with the Cleveland Tramrail crane.

Many mills in the United States and Canada have installations of Cleveland Tramrail block-stripping cranes and carriers. They are stripping draw blocks faster and keeping them in operation more hours a day, thus stepping up output.

Smooth rolling Cleveland Tramrail equipment has been especially designed for this service. It allows a man to take care of more blocks and draw heavier bundles. Older experienced men can usually keep pace with younger fellows when this equipment is provided.

The equipment consists of a hand-propelled crane or carrier with an electric hoist. The crane or carrier is easily pushed on its ball-bearing wheels by means of the rigid arm attached to the carrier. Push buttons, conveniently located in the handle at the lower end of the arm, control the hoist.

Cleveland Tramrail overhead materials handling equipment has been developed to serve every department in rod and wire mills.

GET THIS BOOK!

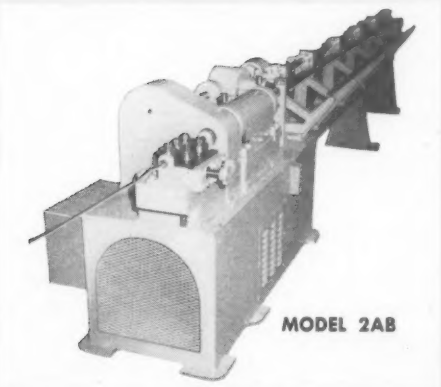
BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
9201 East 288 Street — Wickliffe, Ohio

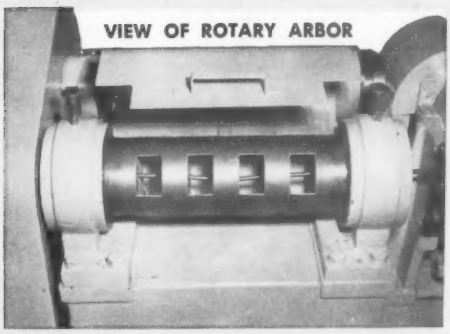
CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

SHUSTER

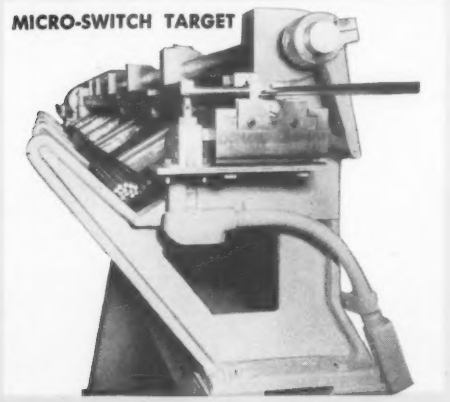
gives it to you STRAIGHT!



MODEL 2AB



VIEW OF ROTARY ARBOR



MICRO-SWITCH TARGET

SHUSTER automatic wire straightening and cut-off machines are designed for volume production, minimum down-time, and lowest operating and maintenance costs.

Here is the new constant speed Model 2AB, a rugged straightener for basic wire from 3/16″ to 3/8″. It provides instantaneous, *electrically* controlled cut-off, triggered by a positive release Micro-Switch target and solenoid clutch control. The operator merely locks the stoprod gauge for desired length of cut, and the machine delivers accurate, square-cut, lengths of wire throughout the production run.

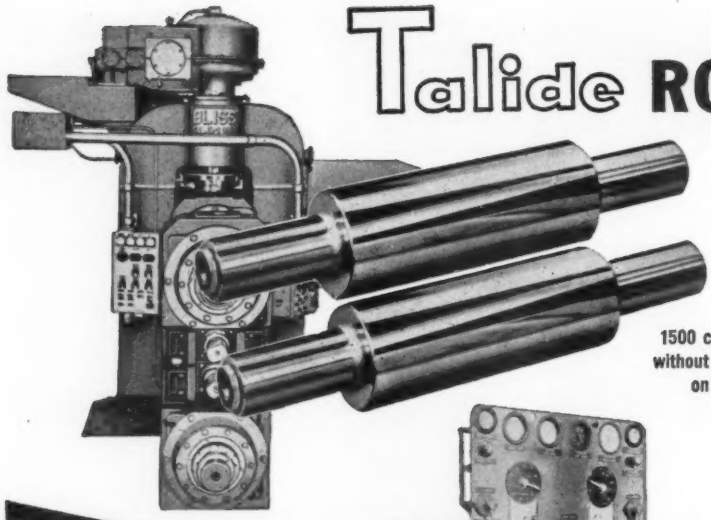
May our engineers be of service to you? In addition to wire straightening and cutting equipment, for sizes from .025 to 11/16″ wire, SHUSTER products include slide feed straighteners, feed starters and straighteners, tube and bar straighteners, and wire reels.

Send for complete literature today to:

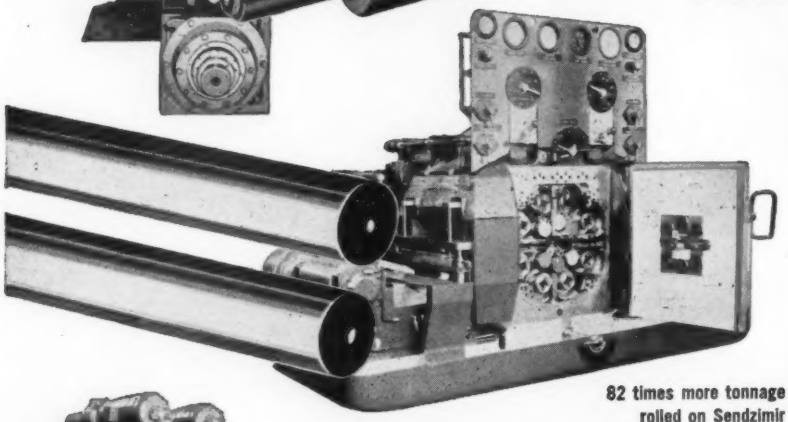
METTLER
MACHINE TOOL, INC.
150 Adeline Street, New Haven, Connecticut

send for free wall size split gauge wire chart from 41 gauge to 7/0

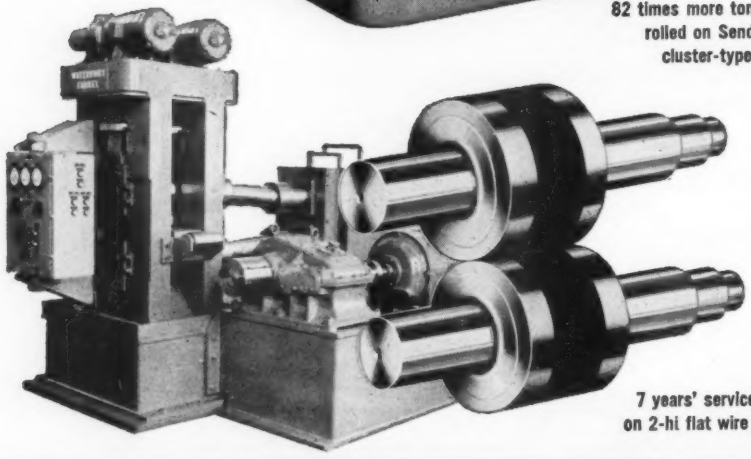
Talide ROLLS OUTLAST ALL OTHERS!



1500 coils rolled without a regrind on 4-hi mill.



82 times more tonnage rolled on Sendzimir cluster-type mill.



7 years' service life on 2-hi flat wire mill.

Talide rolls have proven far superior to both steel rolls and carbide rolls of any other make.

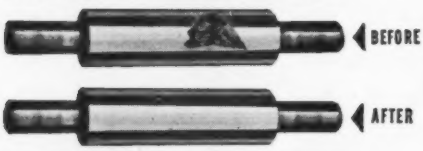
During the last five years Talide rolls have been adopted by every major strip steel producer. Metal Carbides pioneered and developed tungsten carbide rolls and successfully adapted them to all types of rolling mills including STECKEL, BLISS, UNITED, MESTA, STANAT, SENDZIMIR, WATERBURY-FARREL, TORRINGTON, RUESCH, FENN, WEAN, COLD METAL, etc.

Talide work rolls are ultra-hard, extremely dense and porous-free. Manufactured from highest purity tungsten carbide powders, the surface finish of a Talide roll is smoother than one microinch. Hard as a diamond, it will take a "bigger bite" than a steel roll. Strip steel of all analyses can be rolled down to thinner gauge, with more accuracy, greater reductions and with fewer anneals than possible with any other roll.

ONLY TALIDE WORK ROLLS GUARANTEE THESE ADVANTAGES

- ★ MORE PRODUCTION
- ★ BETTER FINISH
- ★ LONGER LIFE
- ★ HIGHER SPEEDS
- ★ CLOSER TOLERANCE
- ★ IMPROVED PHYSICALS
- ★ GREATER REDUCTION
- ★ LESS DOWN TIME
- ★ FEWER REJECTS
- ★ LESS MAINTENANCE

EXCLUSIVE REPAIR SERVICE



Broken or damaged carbide rolls can be re-worked to first class condition with all defects eliminated at one-half original cost. Only Metal Carbides offers this service—because of its exclusive hot press method.

Talide Rolls are made in lengths up to 100", diameters up to 25", and up to 5000 lbs. by weight.

Metal Carbides Corporation,
Youngstown 12, Ohio.

Send for new 76-page catalog 56-G

SUPERSET GRINDING WHEEL

The Superset diamond grinding wheel was specially developed for grinding carbide rolls to highest possible surface finish and luster. Made of 4-8 micron size diamond dust, it imparts a surface finish far superior to any other commercial wheel. Available in sizes up to 25" diameter

METAL CARBIDES CORPORATION
MC
TALIDE®
YOUNGSTOWN 12, OHIO
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HEAVY METAL • ALUMINUM OXIDE • HI-TEMP. ALLOYS
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

Naugatuck MARVINOL

POLYVINYL CHLORIDE RESINS

four resins for electrical application

NAUGATUCK now offers the Wire and Cable Industry *more* PVC resins for insulation extrusion than does any other resin manufacturer.

Two of these Marvinol® resins, VR-22 and VR-23, have already received UL approval. These resins are, respectively, of high and intermediate molecular weight. Both have good dry blending properties.

Marvinol VR-24 and Marvinol MX-2206 are resins of lower molecular weights. They provide high volume resistivity in semi-rigid compounds with little or no plasticizer. Both deserve your careful evaluation for future electrical products.

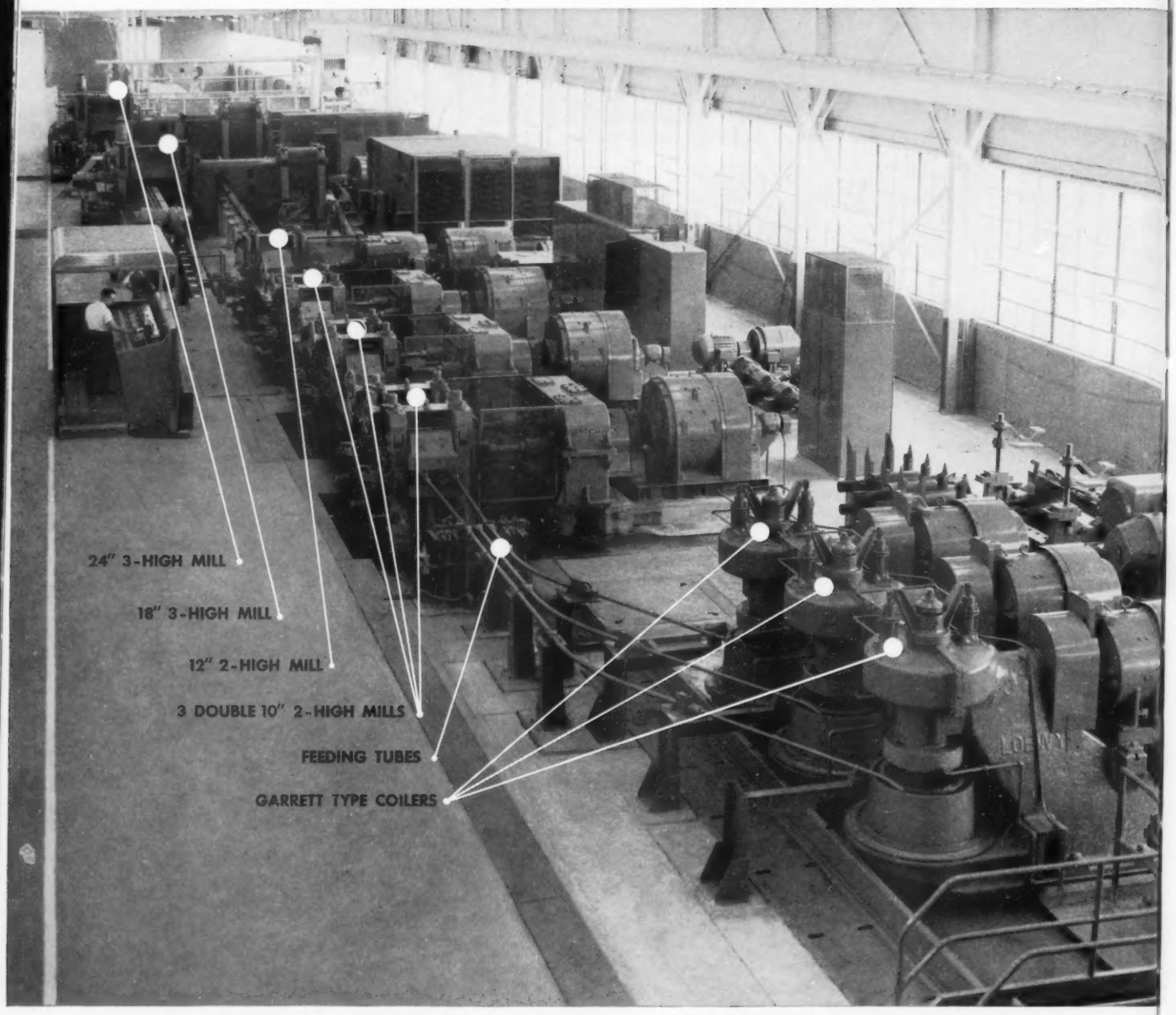
Check with your Marvinol technical representative for complete data and evaluation samples, or write us on your firm's letterhead.

United States Rubber

Naugatuck Chemical Division

Naugatuck, Connecticut

BRANCHES: Akron • Boston • Gastonia, N. C. • Chicago • Los Angeles • Memphis • New York • Phila.
IN CANADA: Naugatuck Chemicals, Elmira, Ontario • Rubber Chemicals • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latices • Cable Address: Rubexport, N. Y.



This installation has a capacity of 40,000 lbs per hour for 2-strand rolling with finished coil delivery every 19 seconds.

new Loewy copper wire rod mill reduces wire bars to 5/16" wire rod, automatically

At the plant of a leading manufacturer of electric cable, this new Loewy mill is rolling 5/16" and 7/16" copper wire rod from standard wire bars in a continuous, fully automatic operation.

The mill consists of two 3-high roughing mill stands, seven continuous finishing stands and three Garrett coilers. Copper wire bars are conveyor-fed into the furnace. After leaving the furnace the ingots are rolled down in 14 passes to finished size. Leaving the last stand at a speed of 2400 FPM the wire is coiled. The coils are tied and conveyed into a pickling line. The entire procedure is automatic and all operations are controlled from one operator pulpit.

Like this high-speed wire rod mill, all Loewy equipment is designed to produce more, in less time, at lowest cost. We design, build and install blooming and slabbing mills, plate mills, structural and rail mills, bar and skelp mills, continuous billet and strip mills for ferrous and non-ferrous metals as well as high-speed foil mills. For illustrated bulletin 14002, write Dept. 170, Loewy-Hydropress Division, BLH Corporation, 111 Fifth Avenue, New York 3, N.Y.

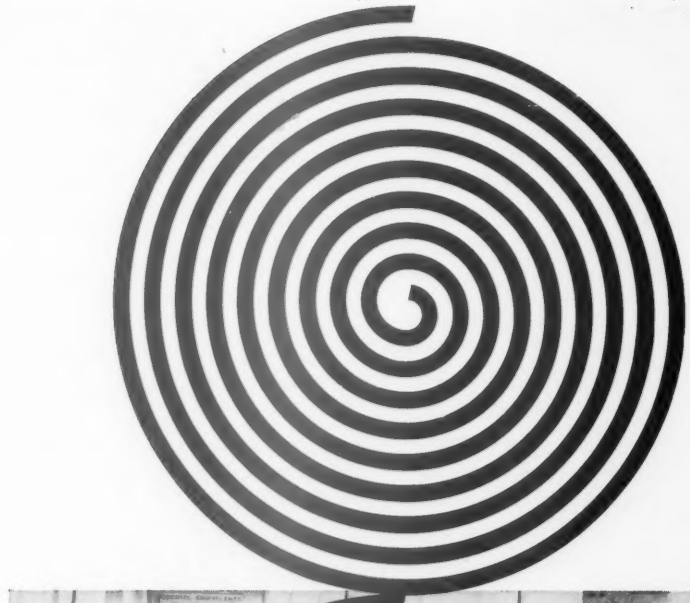
BALDWIN BLH LIMA-HAMILTON

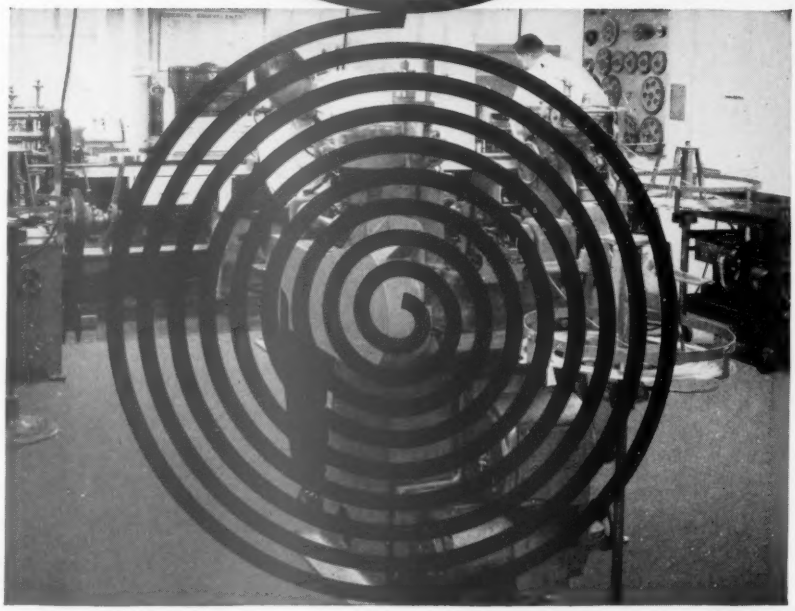
LOEWY-HYDROPRESS
BALDWIN-LIMA-HAMILTON

DIVISIONS: Austin-Western • Eddystone • Hamilton • Electronics & Instrumentation • Lima • Madsen • Loewy-Hydropress • Pelton • Standard Steel Works

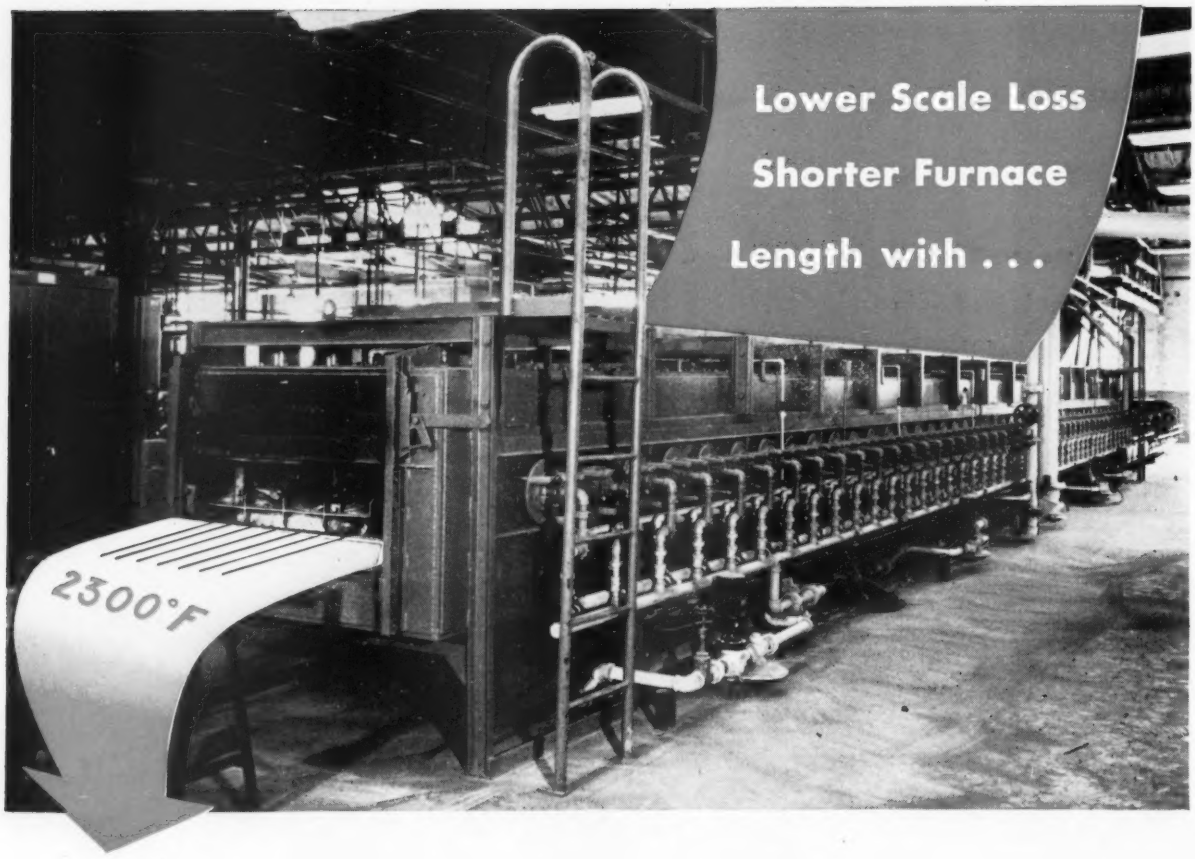
SPRING CLINIC

Torrington leads the field in the development of the most advanced wire forming equipment available today. One of the reasons is Torrington's Wire Forming Laboratory, devoted exclusively to the professional springmaker's problems. This kind of close and constant study of our customers' needs has resulted in wire forming machinery tailored to meet the toughest requirements for versatile and economic production. If *you* have problems in coiling or costing, your inquiries will be classified CONFIDENTIAL!





THE
TORRINGTON
MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT
VAN NUYS, CALIFORNIA · OAKVILLE, ONTARIO



GASMACO wire patenting furnaces

GASMACO Wire Patenting Furnaces substantially reduce maintenance and operating costs and keep production at a steady pace. Elevated furnace temperatures heat faster; permit shorter furnace design and thus offer floor space bonuses.

Necessity of alloy muffle tubes eliminated. Indirect-fired GASMACO Patented Silicon Carbide Radiant Tubes virtually eliminate "down time," and supply high thermal head with atmosphere control over scale.

For a complete description of a GASMACO Wire Patenting Furnace at work, write for your copy of Bulletin A-106.

THE GAS MACHINERY COMPANY, INDUSTRIAL FURNACE DIVISION
16110 Waterloo Road, Cleveland 10, Ohio
In Canada: The Gas Machinery Co. (Canada) Ltd., Hamilton, Ont.

Check first with GASMACO for latest industrial furnace designs.

THE gas machinery COMPANY

GAS PLANT EQUIPMENT
AND INDUSTRIAL FURNACES

For the tough Cold Heading jobs...

KEYSTONE XL WIRE STUDY

Accurate Threaded Fasteners, Inc. looks to KEYSTONE XL WIRE

Unusual and difficult jobs are a challenge to the cold heading division of Accurate Threaded Fasteners, Inc., Chicago, Ill. With their combination of know-how, ingenuity, good machines and Keystone "XL" Wire, they can tackle just about any type of job that comes along—from long production runs to short runs of specials. Shown here are a few examples of their work—in each case the flowability of Keystone "XL" Heading Wire made the job better, faster and cheaper.

And so, another modern wire user learns to depend on Keystone Wire for its exceptional internal and external soundness, accurate size and uniformity of composition and coating.

The list of satisfied customers using Keystone "XL" Wire for both the out-of-the-ordinary jobs, as well as production jobs, keeps growing every day. *Your* name should be included in this list—perhaps for both your cold headed fasteners and parts of your finished products as well.

Check with your Keystone representative for complete details. Our staff of metallurgists and our broad facilities are at your command.

Keystone Steel & Wire Company, Peoria 7, Illinois

KEYSTONE
WIRE FOR INDUSTRY

This fastener was cold headed in an open die. Note that the threads are rolled on, with maximum diameter equal to the rest of the stock. Keystone "XL" flowability was the secret.

This special socket for a spotlight swivel would have involved excessive machining and much material waste. It was cold headed involving a severe upset of 5.5 diameters, and an exceptionally thin-sectioned head. The secret was Keystone "XL" flowability.

This set screw was formed with a blunt point in the double stroke header without machining. The secret was Keystone "XL" Heading Wire flowability.

Keystone Steel & Wire Company
Peoria 7, Illinois

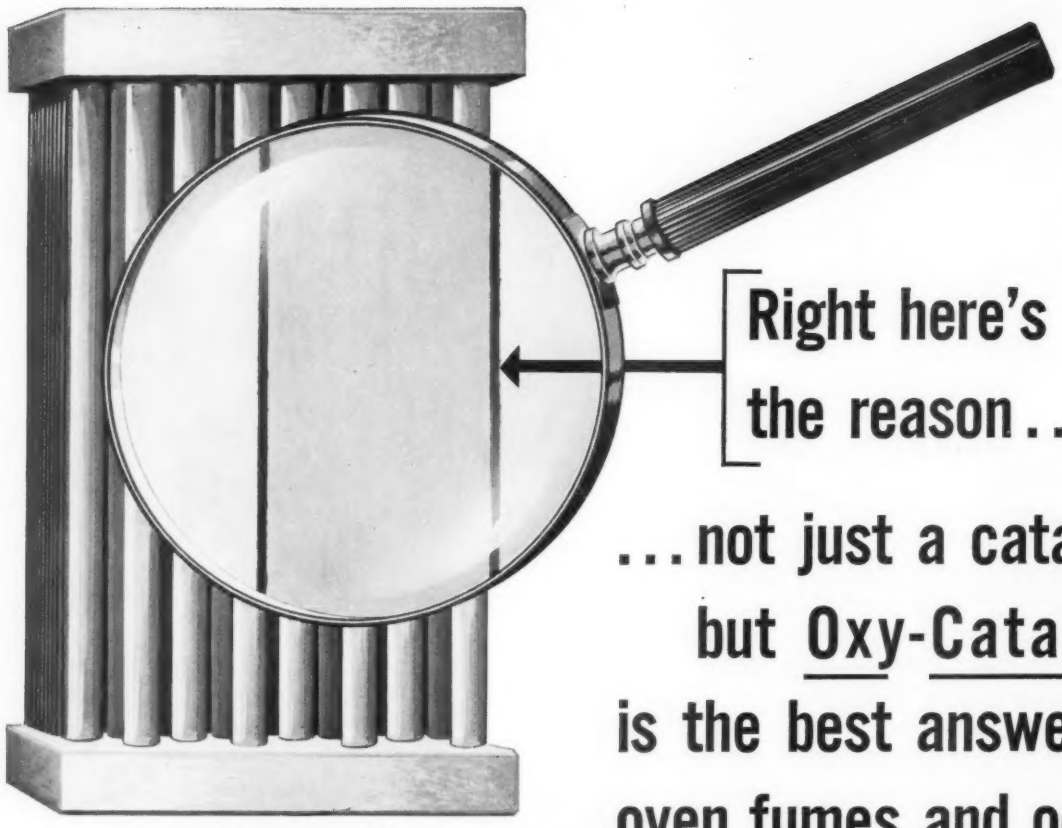
COLD HEADING FACTS FOLDER . . . send coupon today! New folder discusses uses, applications, methods, technical facts, wire requirements.

Name_____ Title_____

Company_____

Street_____

City_____ State_____



Enlarged cross-section drawing of an individual rod in an Oxycat unit

Right here's the reason...

...not just a catalyst but Oxy-Catalyst is the best answer to oven fumes and odors

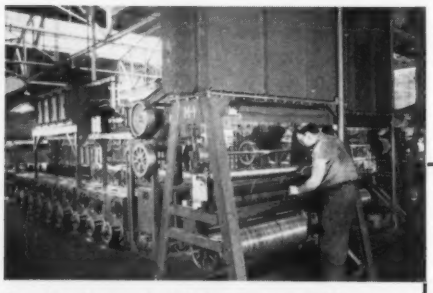
The secret lies in the .003-in. film on the porcelain Oxycat carriers. It's this more efficient catalyst which Oxy-Catalyst uses, a patented combination of alumina and platinum on porcelain, that gives better cleanup, better heat recovery, and longer catalyst life.

Oxycats can eliminate fumes and odors from drying ovens and other processes by oxidizing organic and combustible contaminants in the exhaust far more efficiently than any other catalyst ever developed.

To stop your oven fumes and odors—to recover waste heat—to reduce fire hazards and maintenance problems caused by troublesome condensates, Oxy-Catalyst offers a complete engineering service. We make the entire installation—engineered to your exact requirements—and we assume full responsibility for its performance.

Oxy-Catalyst works closely with all leading oven manufacturers. And new ovens can be designed with the catalyst as an integral part of the oven's heating system. So when you order new ovens, specify Oxy-Catalyst equipment.

If you would like to compare—to see for yourself the remarkably high efficiency of an Oxy-Catalyst installation—fill in this coupon, or write on your business letterhead, for complete information now.



Oxycat units were installed at the end of this vertical drying oven to oxidize troublesome solvent and varnish fumes at John A. Roebling's Sons Corporation, Electrical Wire Division Plant. This installation has been operating now for over 4 years.

OXY-CATALYST, INC.

Industrial Division • Wayne, Pa., U.S.A.

Fume Elimination Processes and Equipment: Industrial • Automotive • Consumer Products

Oxy-Catalyst, Inc., Industrial Division, Wayne 12, Pa.

Please send me complete information on your catalytic installations:

☐ For fume and odor elimination ☐ For waste heat recovery ☐ Have your representative call

Name_____

Firm Name_____

Street_____

City_____ Zone No._____ State_____

NEW

SLEEPER & HARTLEY
UNIVERSAL SPRING COILER
No. 3 Escapement Type

Designed and Built for Speed plus Accuracy

Here is a new heavy duty escapement coiler that is designed to give you more production, faster profits, lower maintenance cost. The exceptional wire feed range, made possible by the automatic cycling attachment, gives you that extra plus to meet all job requirements.

An important feature of this machine is the wire feed accuracy originated and developed by S & H on their escapement coilers. This #3 escapement coiler is another outstanding S & H quality product in a complete line of Universal Spring Coilers built for present and future high speed production.

SERIES 723
430″ MODEL

Angular wire line for low payoff reel position.

Wire Range .092″ to .283″.
Wire Feed Range 0 to 430″.
Vari-Speed Motodrive
37 to 300 ft. per min. production range.
Automatic cycling attachment gives up to 3000″ of wire feed.

Manual cutter control allows continuous coiling and cutting at will of operator.

Easy coil starting with manual lever.

Foot lever releases feed roll pressure on the wire for tooling purposes.

Write for latest information...

EST. 1911

SLEEPER & HARTLEY, INC.
Box 1249, WORCESTER, MASS.

ORIGINAL MANUFACTURERS OF UNIVERSAL SPRING COILERS

U.S.I.

Vol. II, No. 4

POLYETHYLENE PROCESSING TIPS

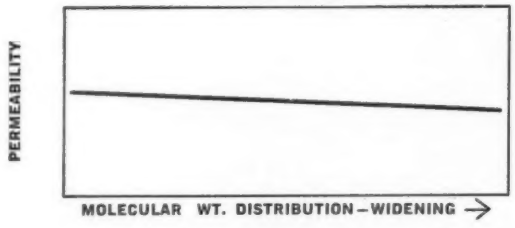
HOW MOLECULAR WEIGHT DISTRIBUTION AFFECTS POLYETHYLENE PROPERTIES

MOLECULAR WEIGHT DISTRIBUTION is one of three basic characteristics that determine the properties of articles made of polyethylene. MOLECULAR WEIGHT and DENSITY are two others.

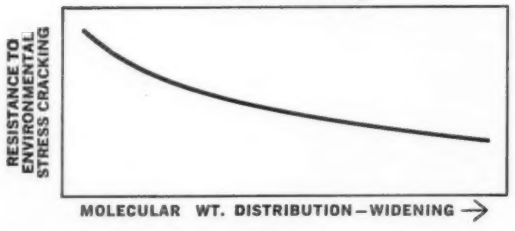
Any polyethylene resin contains molecules of many different sizes. Molecular weight distribution is a measure of how widely these sizes vary from the average.

The following graphs show the effects of widening MWD, assuming density and molecular weight remain unchanged. In aiming for specific end properties, of course, all three characteristics must be taken into account, as all can be varied.

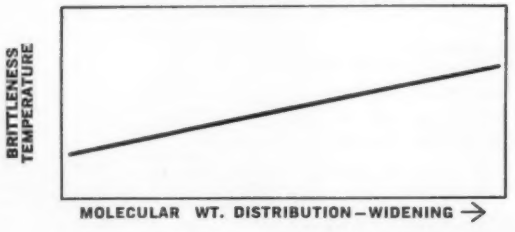
Permeability



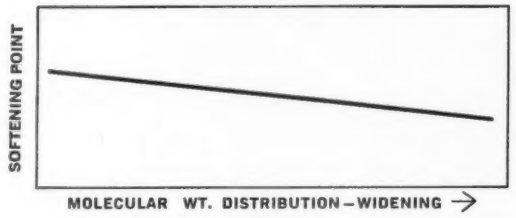
Resistance to Environmental Stress Cracking



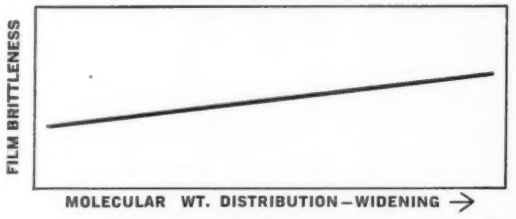
Low Temperature Brittleness



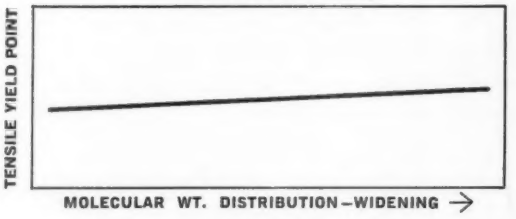
Softening Point



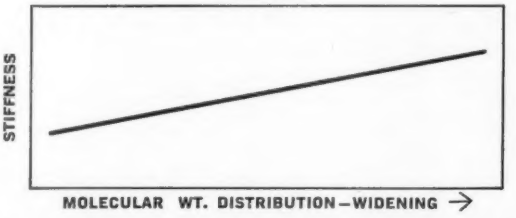
Film Brittleness



Tensile Yield Point



Stiffness



U.S.I. "Tips" covering the effects of density, molecular weight and molecular weight distribution have now appeared, and make a handy reference guide. To receive copies, just ask for back issues of "Polyethylene Processing Tips."

If you're planning a new or improved polyethylene product remember that U.S.I. PETROTHENE® resins have been tailored to give you the properties you want.

Why not call in a U.S.I. technical service engineer ...and talk over your project with him.

U.S.I. INDUSTRIAL CHEMICALS CO.
Division of National Distillers and Chemical Corporation
99 Park Avenue, New York 16, N. Y.
Branches in principal cities

ANNOUNCING THE ENTWISTLE CONTINUOUS DUAL FLYER PAY-OFF

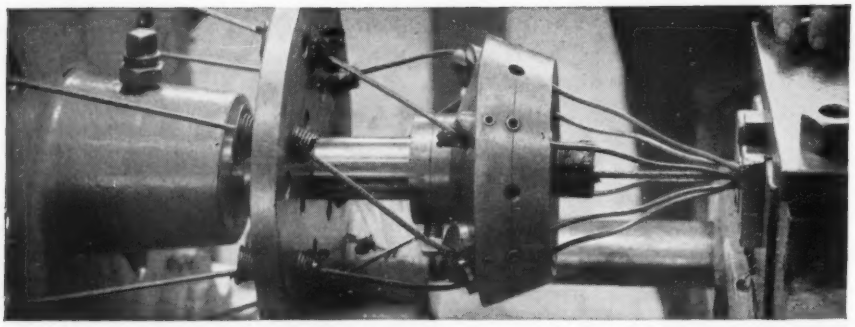
Step Up Your Extruder Line Capacity, Simplify Reel Handling Problems With This New High Speed Unit.

Your extruder line operation will reach a new high in speed and efficiency with the new Entwistle Dual Flyer Pay-Off. This new unit enables continuous pay-off of wire in speeds in excess of 3500 FPM, reel weights up to 1500 lbs., and wire sizes down to No. 26 A.W.G.

Switch-over to the second reel is accomplished automatically through a polished steel opening in between the hoods. Braking of reels and all inertia problems are non-existent with this type of pay-off. Dual hydraulic reel trucks make loading and unloading of reels a much simpler operation.

Find out what the new Entwistle Dual Flyer Pay-Off can do for your extruding operations. Write or phone for complete details.

ENTWISTLE
Manufacturing Corporation
1475 ELMWOOD AVE., PROVIDENCE 7, RHODE ISLAND



Close-up view of preforming Lang Lay rope by the quill head method in Upson-Walton's Cleveland plant. Stranded wires are threaded through a guide-plate to the quills for preforming of strands prior to entering the closing dies.

YOUNGSTOWN "YOLECTRO" ROPE WIRE

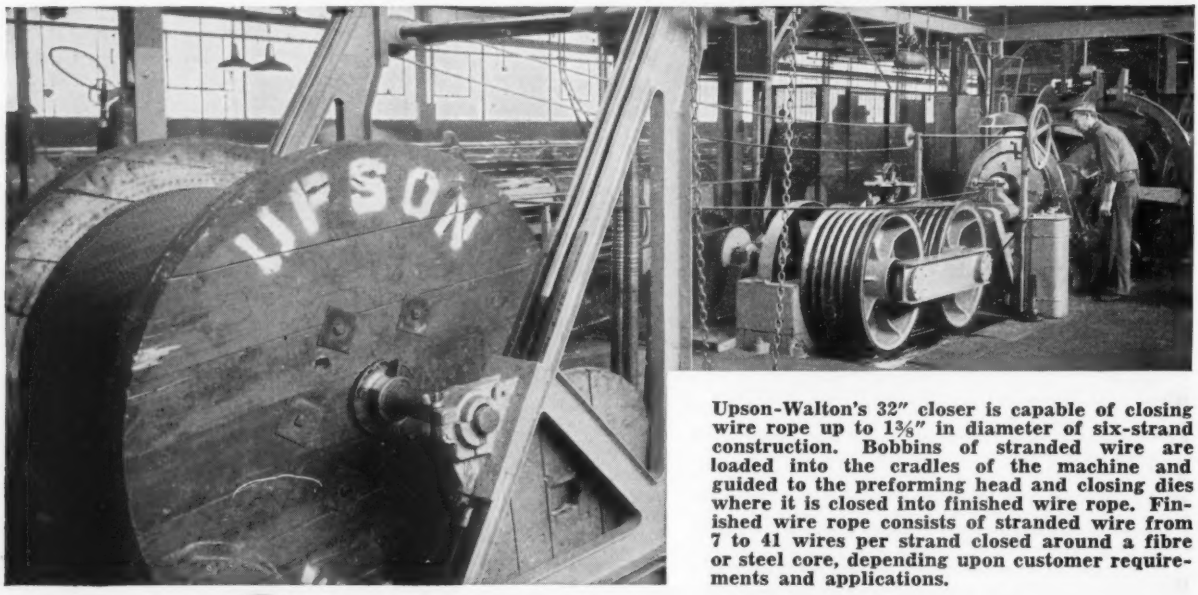
. . . builds strength and safety into **UPSON-WALTON** *wire rope*

Strength and safety are qualities characteristic of Upson-Walton's complete line of wire rope and rope fittings. For nearly 86 years this progressive Cleveland manufacturer has kept their product quality at the highest possible level.

Playing an important part in the Upson-Walton story is Youngstown "Yolectro" High Carbon Rope Wire. It's the basic material used to fabricate their various grades of wire rope. "Yolectro" Rope Wire's high degree of strength, toughness, abrasion resistance, gage uniformity and proper flexibility all contribute to the quality associated with Upson-Walton products.

"Yolectro" Rope Wire is closely quality-controlled throughout all its production operations from iron ore mining to final drawing and coating. This guarantees the desired balance of properties to meet your most exacting requirements. Why not make "Yolectro" your permanent specification for quality production? It's available with either a Bright or Galvanized finish in all AISI high carbon grades.

Metallurgical assistance or additional information is available from your nearest Youngstown District Sales Office. Why not write or phone them today?



Upson-Walton's 32" closer is capable of closing wire rope up to 1⅜" in diameter of six-strand construction. Bobbins of stranded wire are loaded into the cradles of the machine and guided to the preforming head and closing dies where it is closed into finished wire rope. Finished wire rope consists of stranded wire from 7 to 41 wires per strand closed around a fibre or steel core, depending upon customer requirements and applications.

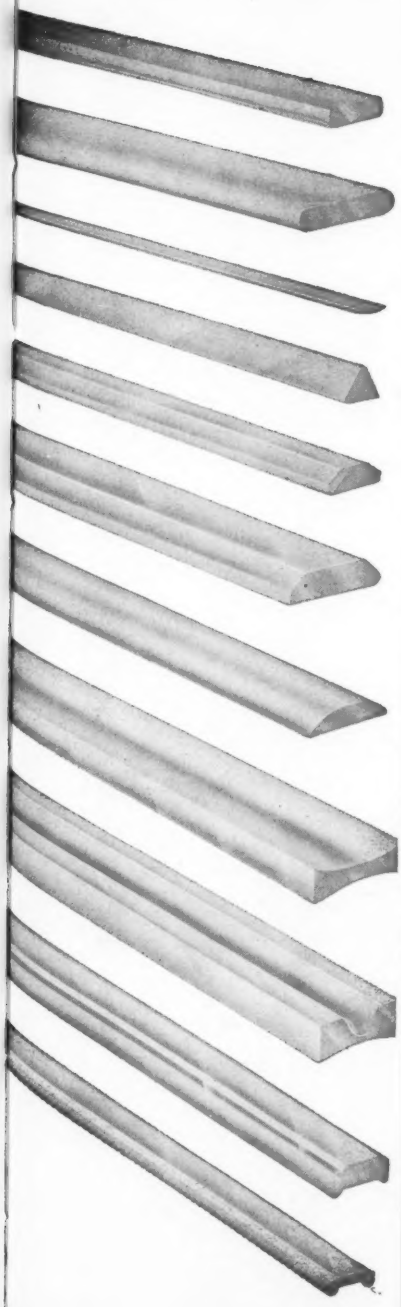
QUALITY YOUNGSTOWN SERVICE

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel

General Offices - Youngstown 1, Ohio

District Sales Offices in Principal Cities



NATIONAL WIRE

(COLD ROLLED)

in Coils or Straight Lengths

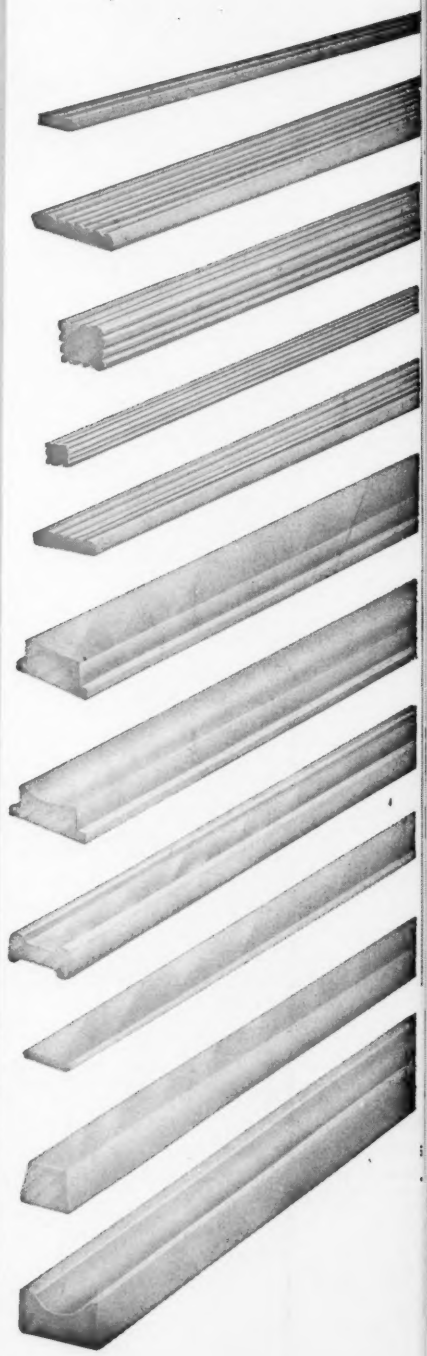
COMPLETE METALLURGICAL SERVICE

Manufacturers of

SPRING WASHERS	RETAINING RINGS
ROUND EDGE FLAT WIRE	KEYSTONE SHAPED WIRE
SQUARE EDGE FLAT WIRE	SPECIAL SHAPED WIRE

Shaped Wire in Coils or Straight Lengths, Ferrous or Non-Ferrous.

LARGE OR SMALL QUANTITIES

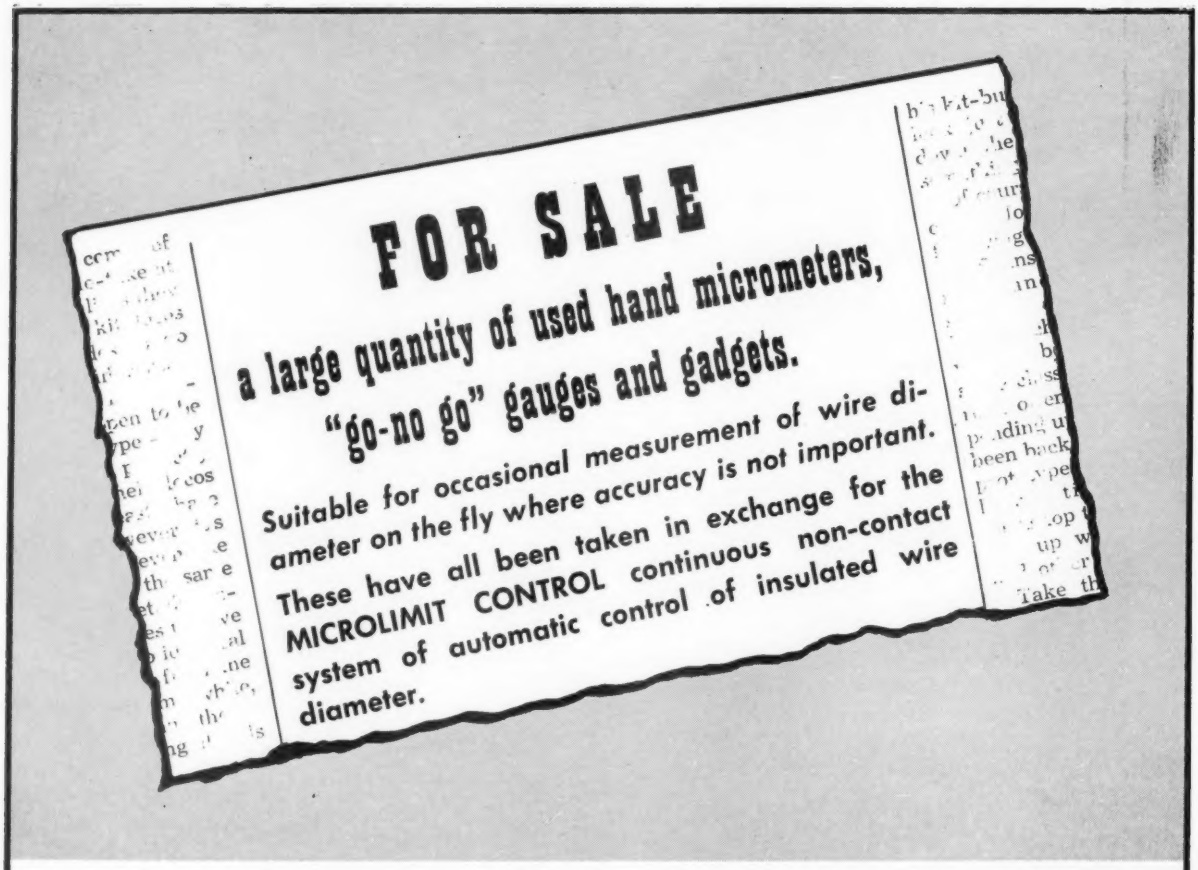


Manufactured by

THE NATIONAL LOCK WASHER COMPANY

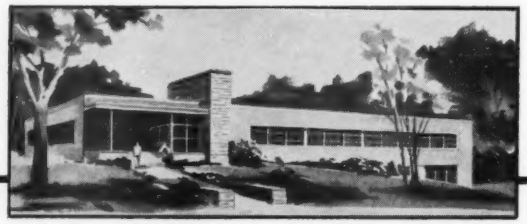
PRECISION SHAPED WIRE DIVISION

NEWARK 5, N. J. MILWAUKEE 2, WIS. U.S.A.

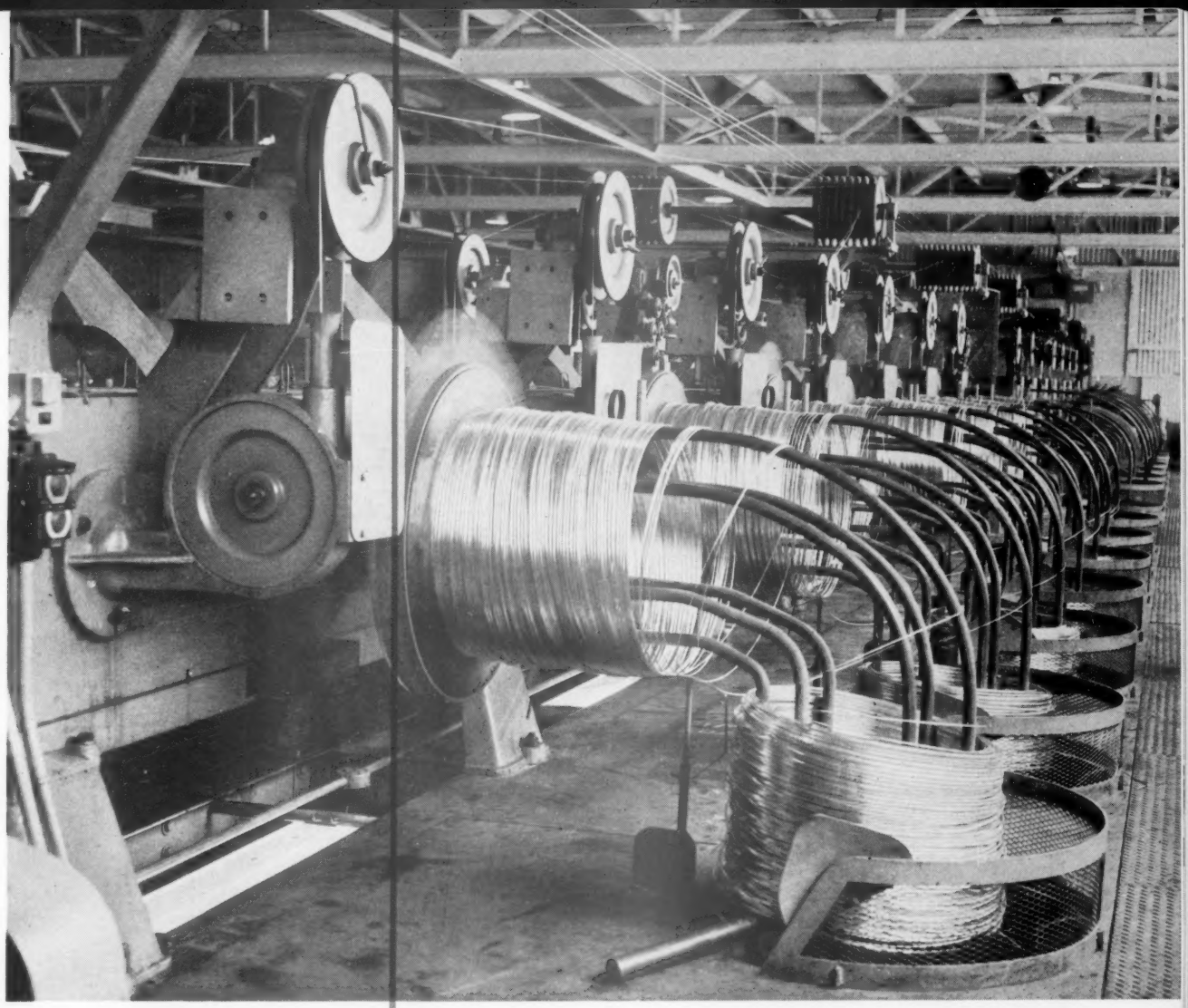

FOR SALE
a large quantity of used hand micrometers,
"go-no go" gauges and gadgets.
Suitable for occasional measurement of wire diameter on the fly where accuracy is not important.
These have all been taken in exchange for the MICROLIMIT CONTROL continuous non-contact system of automatic control of insulated wire diameter.

For the progressive insulated wire producers we offer the MICROLIMIT CONTROL—successor to the hand micrometer and other contact type gauges. Where quality is paramount and production costs are important the MICROLIMIT CONTROL is essential to success.

For further information—



INDUSTRIAL GAUGES CORPORATION • WEST ENGLEWOOD, NEW JERSEY



"A recent North American Installation"

Take Up Frames for galvanised and patented wires with stationary blocks or convertible to rotating action.

WILHELM BREITENBACH
Maschinenfabrik
und Eisengießerei GmbH
UNNA/Westfalen
Western Germany

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Exclusive Representatives for U.S.A. and Canada
Jedwin of Canada, Limited, 170 Bloor Street West, Toronto, Ontario, Canada
Telephone: WA. 1-3147

With

NOPCO® KLY

a liquid fine wire drawing lubricant

Be sure to try Nopco KLY next time you're drawing fine size steel or fine and intermediate size copper wire. It's *different*—and everything different about it you'll find is a big advantage.

First, this emulsifiable oil mixes quickly and completely with water—hot or cold. This feature alone is enough to make it ace-high with you. But it has other advantages equally important.

Your bath lasts longer. Nopco KLY has a built-in affinity for water. Its lubricants stay *uniformly active* much longer, since the "drag out" of the lubricants from the solution is reduced beyond anything you've ever seen.

Prevents Formation of Insoluble Copper and Lime Soaps—both the copper soaps, which score dies, clog feed lines and screens; and the lime soaps you've been bothered with when drawing lime coated steel wire.

KLY may be used for high carbon, low carbon, limed, galvanized, and liquor finished fine steel wire—also for fine and intermediate copper, bronze, and brass wire. You'll surely want to try this die-saving, cost-saving lubricant soon. Write today for free booklet "Nopco KLY", which gives full instructions, lists percentages of fat in all emulsions.
Nopco Chemical Company,
Harrison, N. J.

YOU MIX IT FASTER, EASIER

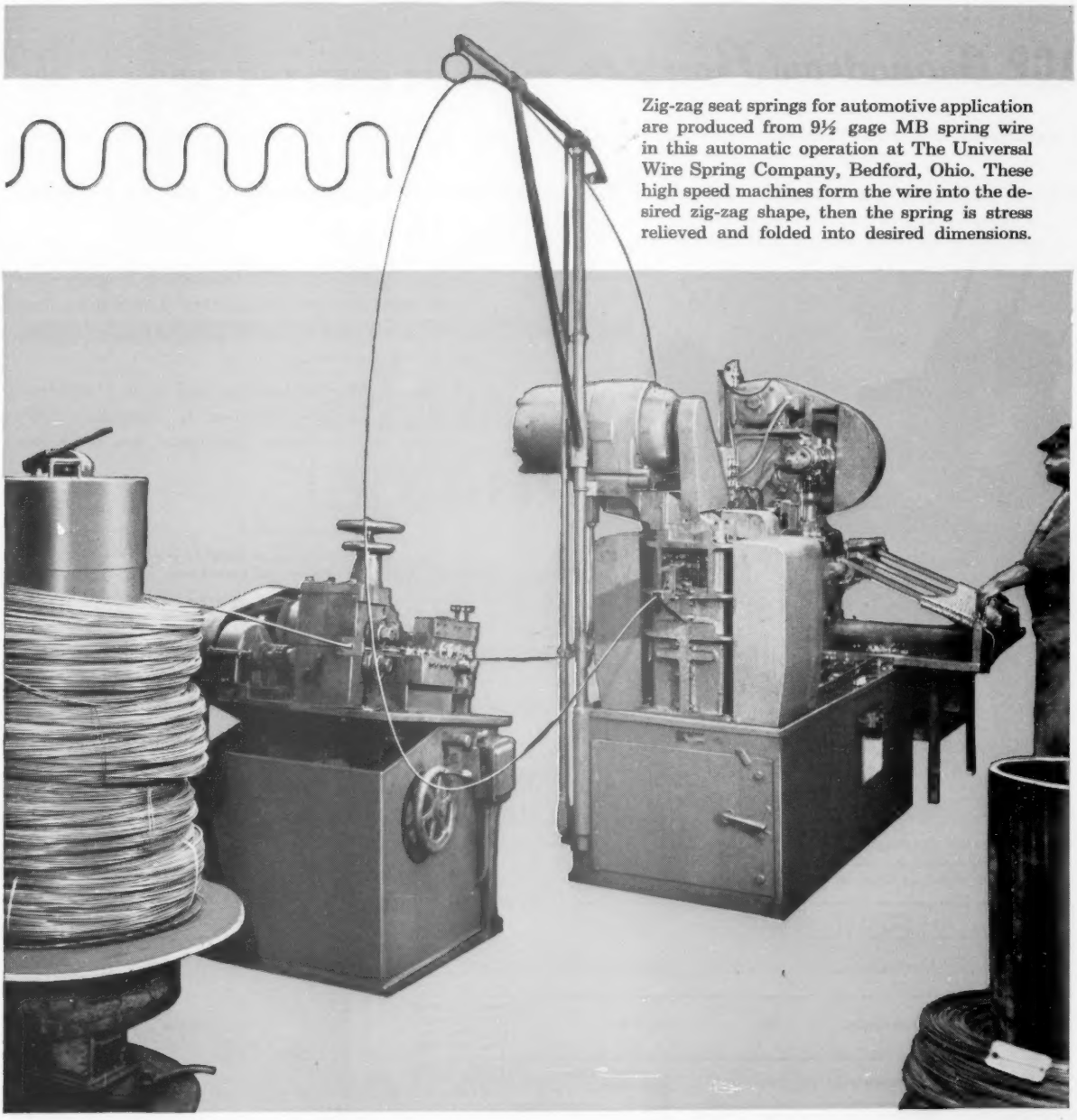
YOUR BATH LASTS LONGER

YOU GET UNIFORMLY ACTIVE LUBRICATION

1907–1957 *50 Years* OF PROGRESS IN CHEMISTRY

NOPCO

PLANTS: Harrison, N. J.
Cedartown, Ga. • Richmond, Calif.
London, Canada



Zig-zag seat springs for automotive application are produced from 9½ gage MB spring wire in this automatic operation at The Universal Wire Spring Company, Bedford, Ohio. These high speed machines form the wire into the desired zig-zag shape, then the spring is stress relieved and folded into desired dimensions.

AUTOMATIC production requires AUTOMATIC quality of

J&L SPRING WIRE

Every coil of J&L spring wire is thoroughly tested for uniformity of physical and dimensional properties. This uniformity of J&L's famous Mastercraft, hard-drawn MB or Electromatic oil-tempered MB spring wire speeds production, reduces rejects, in automatic operations.

J&L exercises rigid quality control in every phase of production from ore mine to finished product. J&L wire is tops in quality . . . competitive in price.

Call your J&L representative the next time you order spring wire. Or write direct to the Jones & Laughlin Steel Corporation, Dept. 448, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

Jones & Laughlin STEEL
. . . a great name in steel

ACP Granodraw® Processes ELIMINATE COSTLY LEADING AND DE-LEADING OPERATIONS IN THE DRAWING OF STAINLESS STEEL WIRE; ALSO SAVE MONEY IN OTHER DRAWING, STAMPING AND EXTRUDING OPERATIONS

IN DRAWING OF STAINLESS WIRE, ACP Granodraw SS eliminates costly leading and de-leading operations. All Granodraw coatings offer greater speed of draw, longer die life and finer finish on all types of wire.

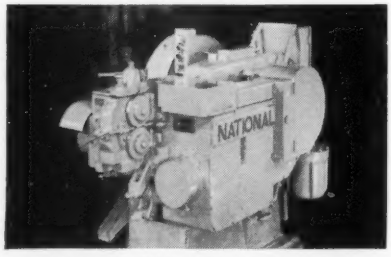
In all operations, ACP Granodraw coatings prevent metal-to-metal contact, thus eliminating galling and seizing. They act as a carrier for the lubricant, reducing friction.

In the drawing of stainless steel wire, Granodraw SS® is particularly effective. It eliminates costly leading and de-leading operations, has these plus advantages over lead:

- **Is easier to apply**
- **Is easier to remove**
- **Minimizes loss of metal by eliminating lead pickup and intergranular breakdown**
- **Eliminates health problems inherent in the handling of lead**
- **Cuts process time**
- **Offers a straightline cleaning process that completely removes all coating**
- **Eliminates contamination problems**

ACP Granodraw coatings—Granodraw for steel, Granodraw SS for stainless—also mean greater speed of draw, greater total reductions, longer die life, fewer process anneals, and less pickling. They produce finer finishes, afford easier inspection of finished product, and give more effective lubrication.

ACP GRANODRAW	Type of Coating	Type of Metal Treated	Method of application	Typical Applications
No. 1	Zinc phosphate	Steel	Dip (tanks)	Bumper Forming Deep Drawing Cold Extrusion Wire, Rod, Tube
No. 2	Zinc phosphate	Steel	Dip (tanks)	Bumper Forming Deep Drawing Cold Extrusion Wire, Rod, Tube
No. 4	Zinc phosphate	Steel	Spray (multi-stage power washer)	Bumper Forming Deep Drawing Cold Extrusion
No. 25	Zinc phosphate (microcrystalline)	Steel	Dip (tanks)	Wire and Tube Drawing
SS	Complex oxalate	Stainless Steel	Dip (tanks)	Wire and Tubing
Z	Zirconium fluoride complex	Zirconium	Dip (tanks)	Reactor Tubing



IN COLD HEADING OPERATIONS the ACP Granodraw processes have increased tool life two to fivefold in forming steel fasteners. And rejects of finished products are reduced.

LEARN MORE ABOUT ACP GRANODRAW PROCESSES. Bulletin 1437 describes the advantages and gives information which will help you select the proper type for your particular application. Write for your copy today.

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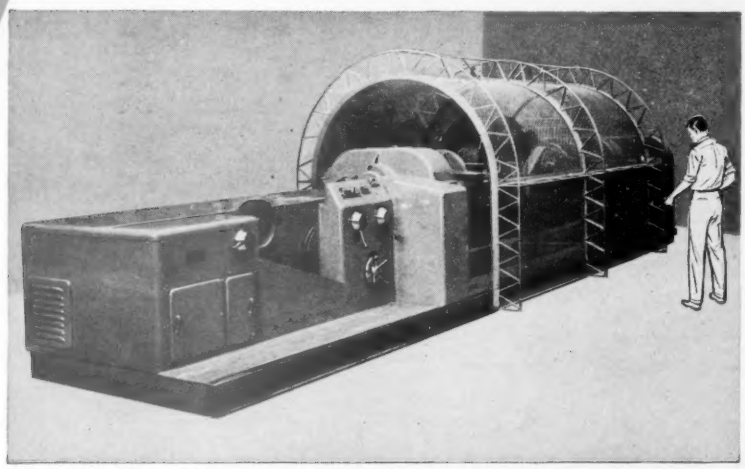

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SYMMETRY STRANDING guaranteed by a spécial device.

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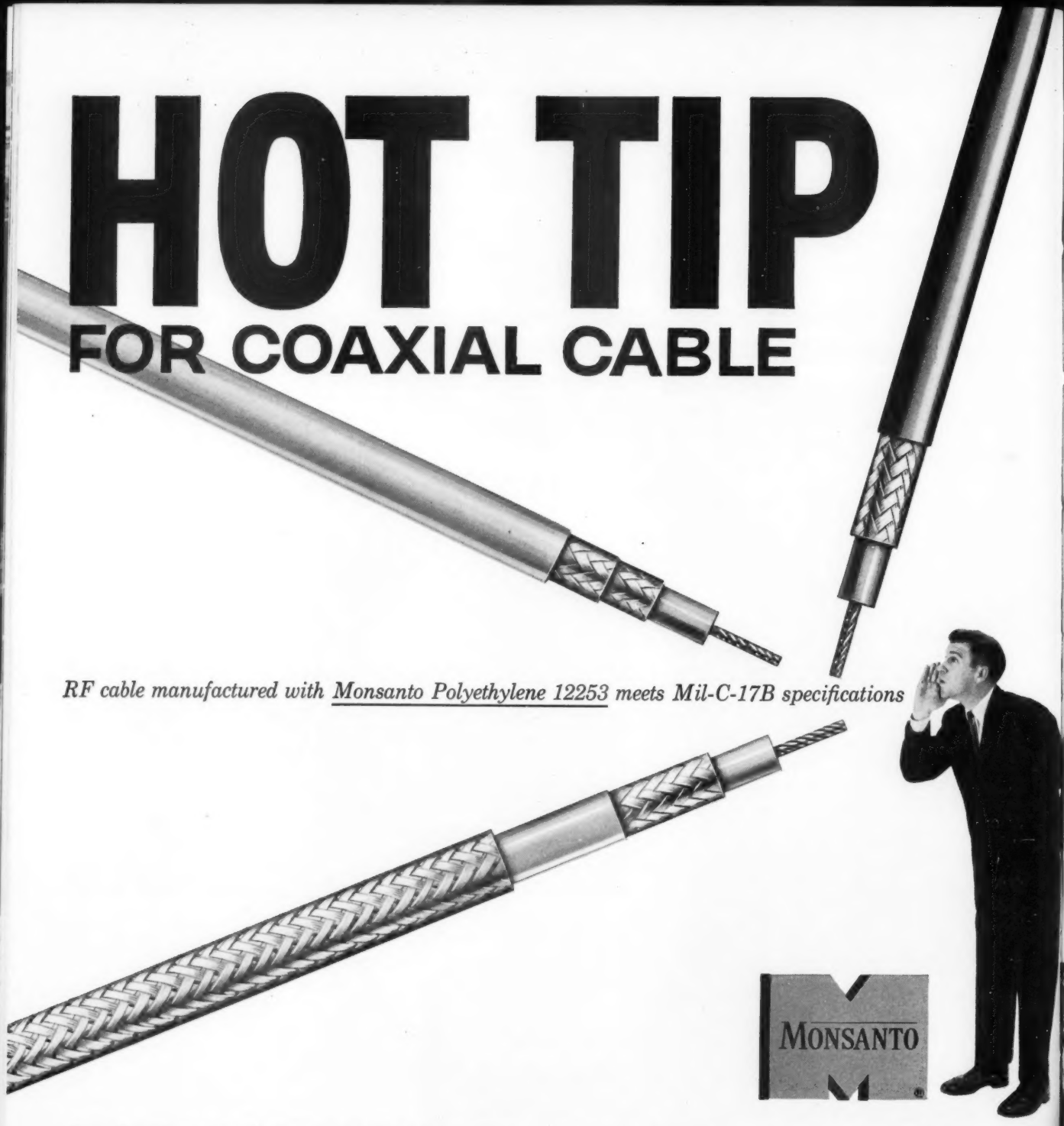


RF cable manufactured with Monsanto Polyethylene 12253 meets Mil-C-17B specifications

Even if you're not producing coaxial cable for military purposes, the development of Monsanto Polyethylene 12253 can have immediate value, since polyethylene used in Mil-C-17B constructions must meet requirements* as rigid as any critical-use cable application.

Monsanto Polyethylene 12253—with its low loss at high frequencies, low dissipation factor, high dielectric strength, flexibility over a wide temperature range, and mechanical strength—readily qualifies as your single, inventory-simplifying, critical-use polyethylene—a non-staining compound for coaxial cable, primary telephone insulation, or power cable.

12253 is one of an expanding series of insulating and jacketing compounds that are products of Monsanto's specialized research on electrical grade polyethylene resins. Write for the complete technical data, to Monsanto Chemical Company, Plastics Division, Room 2009 Springfield 2, Massachusetts.

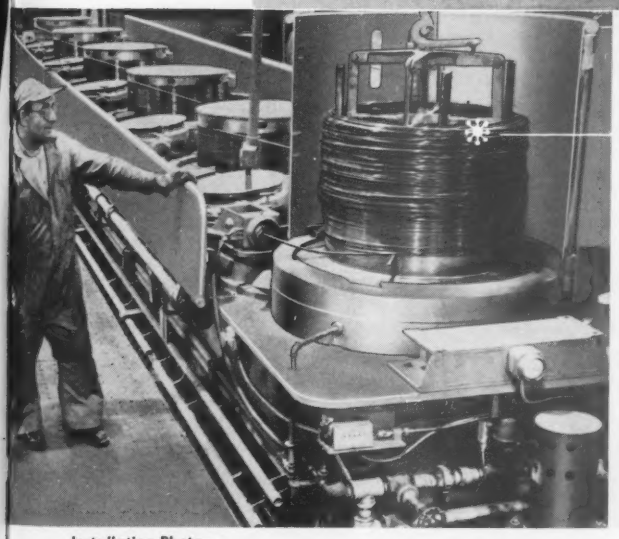
*Mil-D-3054A specifications for insulating compounds used in Mil-C-17B Coaxial Cable.

Typically

Vaughn—

THIS MIGHTY BRIDGE IS SUSPENDED BY *Wire*

Michigan's Mackinac Bridge—world's longest of its kind. Length of main span, 3,800 ft. Length of suspension bridge, 8,614 ft. Number of main cables, 2. Diameter of cables, 24½ in. Number of wires in each cable, 12,876. Total length of cable wire, 41,200 miles.



Installation Photo—
Courtesy American Steel & Wire Division United States Steel Corp.

DRAWN FROM THIS *SINGLE*

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All of the wire for the suspension cables of the Mackinac Bridge—41,200 miles of it—was produced on *one* Vaughn HRX Motoblox. Finishing the 0.192 diameter wire at higher speed and efficiency than ever before attained, the HRX machine employed to the fullest extent its outstanding power and cooling capacities. • *For profitable solutions to your own wire drawing requirements, consult VAUGHN!*

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COMPLETE COLD DRAWING EQUIPMENT—Continuous or Single Hole . . . for the Largest Bars & Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys.

"Quick on the Draw!" Ⓥ®

two point Glidden pattern

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FULLY AUTOMATIC BARBED WIRE MACHINE

for the manufacture of all commercially used types of barbed wire

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three-wire four point Jowa pattern

Waukegan pattern

two point Domingo pattern

Simplex pattern

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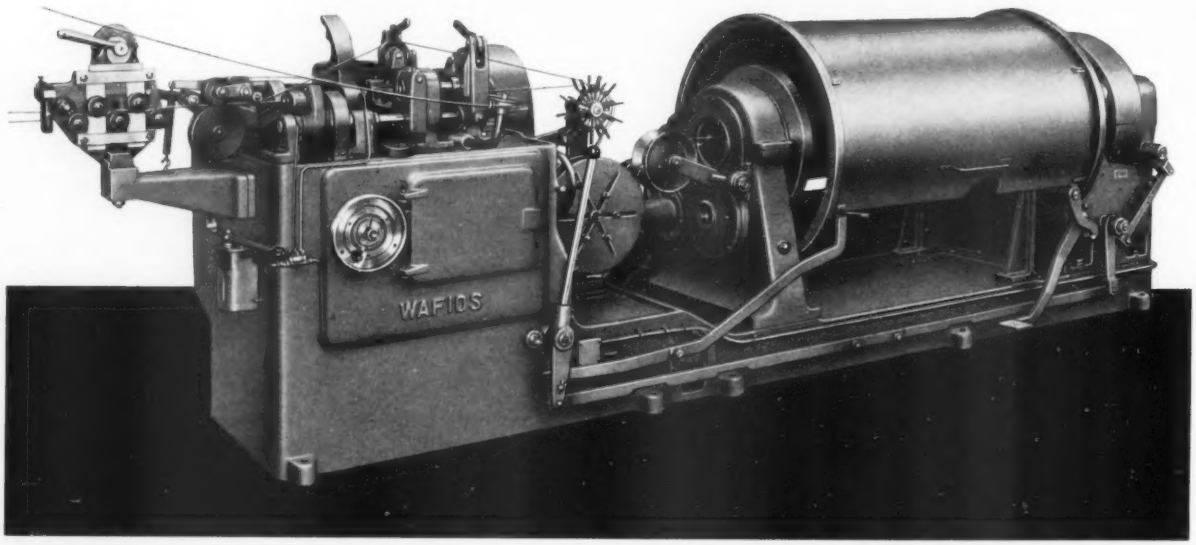
Perfect pattern

The machine is fully automatic and performs all the operations necessary in the production of barbed wire from the wire intake to the finished wound coil. It even stops automatically when the desired length of wire is reached.



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Pittsburgh PX-120 DIDP

Pittsburgh PX-120 (DiIso Decyl Phthalate) offers you a unique combination of properties which make it especially suitable for the economical production of vinyl-jacketed electrical wiring.

PX-120 possesses excellent low-volatility, a prime consideration in vinyl wire insulation, especially where higher-than-normal temperatures are encountered. For additional retention of elongation on aging, Pittsburgh PX-120 can be supplied with Bisphenol A added.

Whatever your vinyl product, you can count on PX-120 for good permanence, resistance to extraction, and low temperature properties . . . plus a low specific gravity that enables you to enjoy appreciable economies on a pound-volume production basis.

May we acquaint you further with this versatile plasticizer? Write for samples and technical data.

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PX-218 IsoOctyl Decyl Adipate
PX-220 Dilso Decyl Adipate
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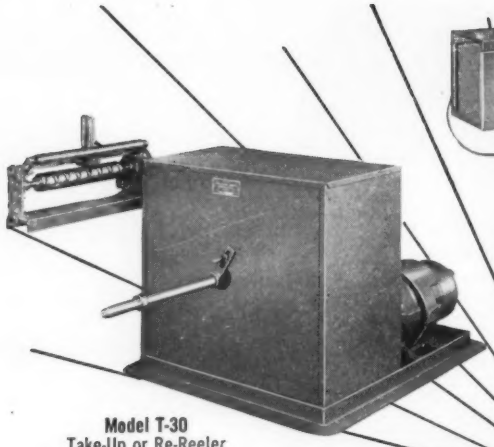

Model T-30
Take-Up or Re-Reeler

No. 4 Spark Tester
Automatic Resparking for Re-Reeling

CV Type Sparker
For Continuous Vulcanizing
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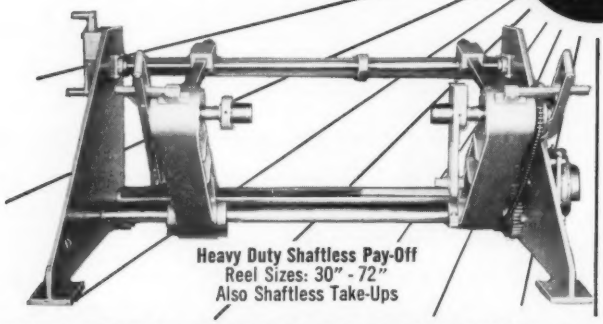
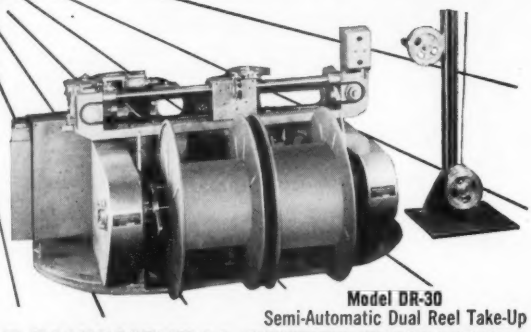


Heavy Duty Shaftless Pay-Off
Reel Sizes: 30" - 72"
Also Shaftless Take-Ups



Model DR-30
Semi-Automatic Dual Reel Take-Up

THE NEWLY REDESIGNED *DAVIS WIRE & CABLE EQUIPMENT* IS BETTER THAN EVER

Modernized, streamlined and engineered for fast production of safely insulated wire and cable, the newly redesigned DAVIS ELECTRIC line of Spark Testers, Pay-Offs, Take-Ups, Counters, Spoolers, Traverses and Capstans is now offered as the finest ever conceived and produced by DAVIS ELECTRIC engineers. Before you buy, you owe it to your pocketbook as well as your business reputation to learn what this unexcelled machinery can do to better satisfy your customers (and your stockholders!). Refinements and advancement in designs qualify the 1957 DAVIS ELECTRIC line to surpass in performance previous DAVIS products in use in 80% of the industry's wire mills and some of which have been in operation for 15 years without maintenance problems!

What better tribute to quality can one ask?

Write for complete details and find out how DAVIS ELECTRIC can improve your wire and cable production and promote profit in your plant.

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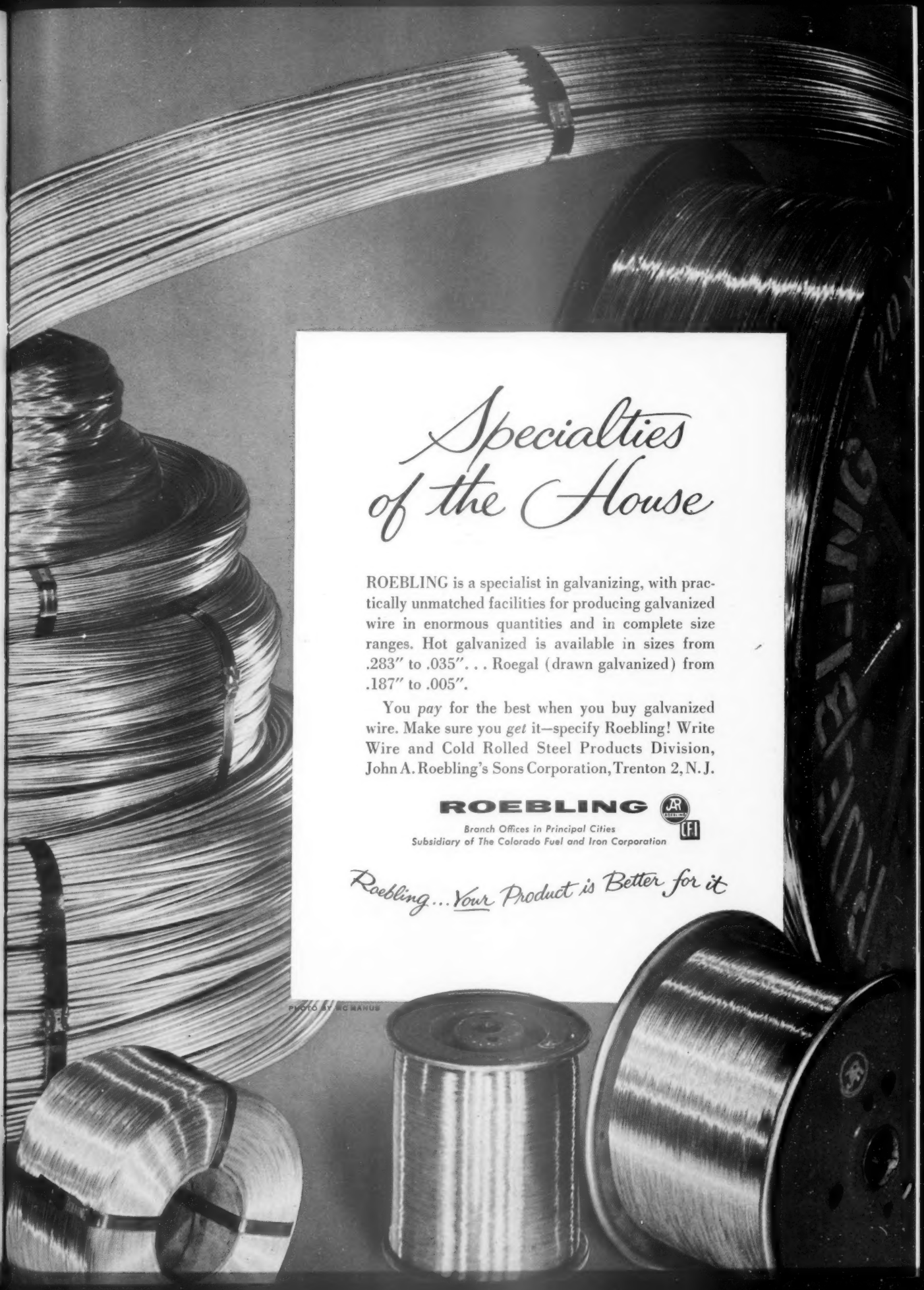

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ROEBLING is a specialist in galvanizing, with practically unmatched facilities for producing galvanized wire in enormous quantities and in complete size ranges. Hot galvanized is available in sizes from .283″ to .035″. . . Roegal (drawn galvanized) from .187″ to .005″.

You *pay* for the best when you buy galvanized wire. Make sure you *get* it—specify Roebling! Write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, N. J.

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Vertical Continuous Vulcanizing

. . . a totally new concept in wire insulation

ANNOUNCEMENT TO THE INDUSTRY

Problems of transformation, scuffing, flattening and scoring in the curing of thick, spongy insulation have been eliminated by Vertical CV. Already in commercial use, Davis-Standard Vertical CV machinery delivers cable insulation of better concentricity, more uniform diameter and improved values in dielectric strength and corona level tests.

There are numerous advantages to drawing the insulated wire downward through the vulcanizing tube:

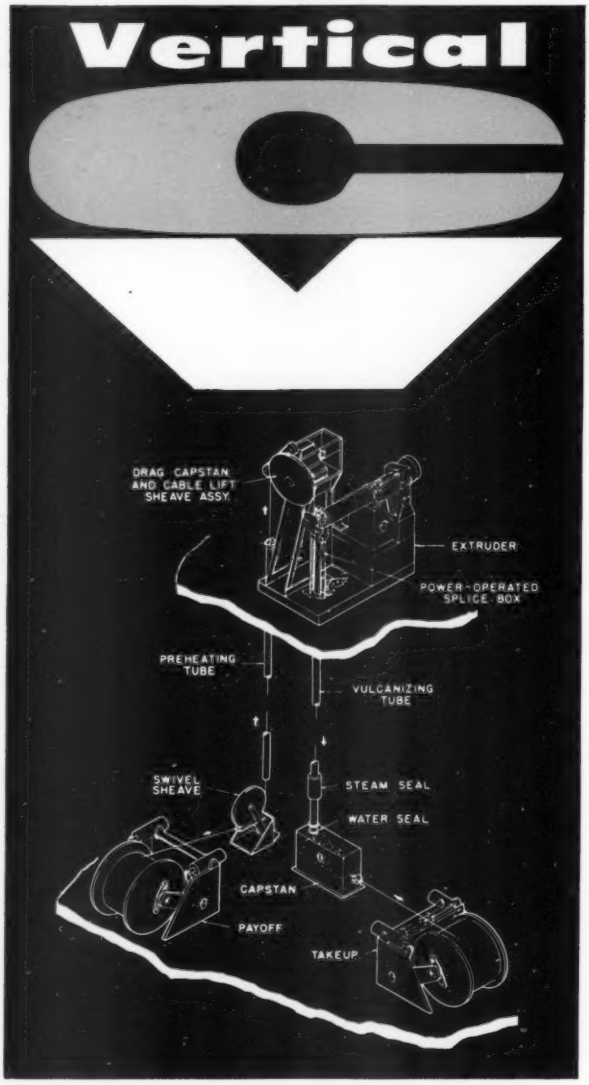
The easily damaged, uncured insulation does not come in contact with the vulcanizing tube until it has been vulcanized by steam and water.

The Drag Capstan, located above the Extruder, can be used to retract wire from the vulcanizing tube.

Vertical CV does not require the valuable floor space occupied by the conventional horizontal vulcanizing process.

Pay-Off, Capstan and Take-Up machinery are located on one floor for convenient reel-handling and operating adjustments.

The desirable feature of pre-heating the wire can be readily accomplished as it travels upward to the extruder.



We are prepared to discuss the application of Davis-Standard's Vertical ***CV*** *machinery to your wire insulating line.*

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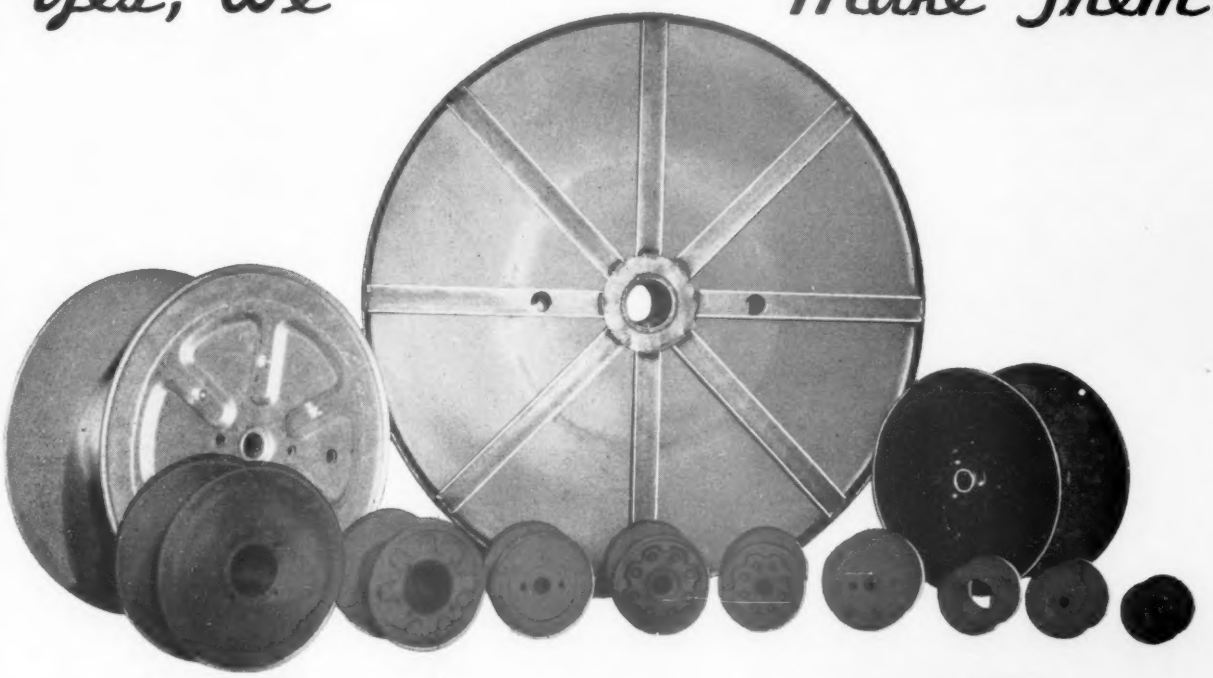

Many types and constructions of Steel Spools and Reels for Shipping and Shop use in plain, painted or plated finishes.

In addition to our standard sizes of Steel Spools, we also have facilities and equipment for producing custom designed Spools and Reels to customers' specifications.

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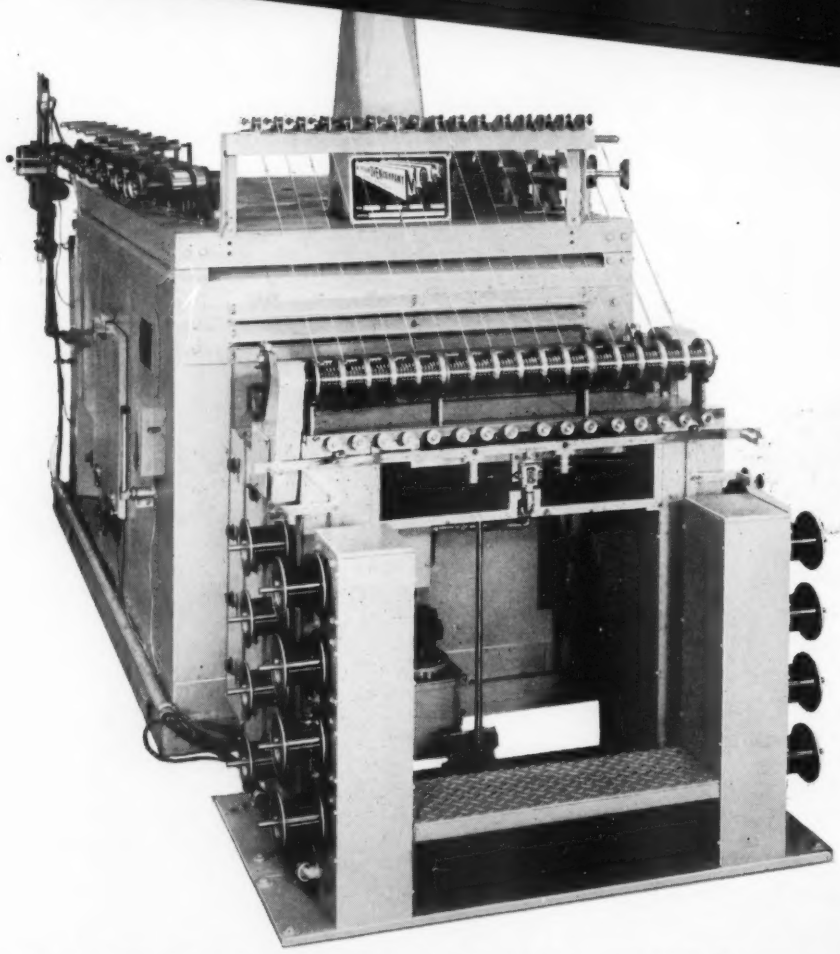
BUY FROM REEL HEADQUARTERS - HUBBARD. ALL MATERIALS AND TYPES

ANOTHER ENGINEERING ACHIEVEMENT BY **MOCO**

Now—A New Wire Enameling Machine That Produces MORE POUNDS OF FINISHED WIRE Per Hour with Commercial Grades of Varnish!



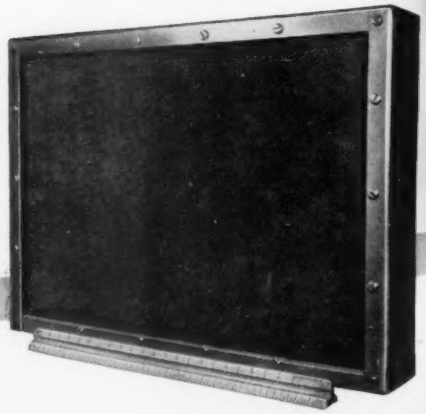
This type "B" wire machine handles wire from 31 A.W.G. to 42 A.W.G. Five other models complete the cycle—from the finest to the heaviest wire. The unique design of the horizontal, high volumetric, recirculating double-pass oven allows greatly increased production by rapid heat impartation and a high degree of temperature uniformity throughout the wire chamber. It is seven feet long inside, with an internal recirculating fan and fume consuming catalyst. The oven can be operated by either gas or electricity.

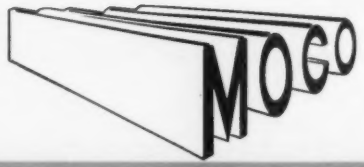
For the first time, modern recirculating oven features—developed in recent years in the electrical manufacturing field—have been combined with the latest wire handling and coating machinery.

Here's a production capacity example: This machine consistently produces 16 heads of #33 A.W.G. with four or six coats of commercial, oleo-resinous or formvar enamels at wire speeds far in excess of 100 f.p.m.

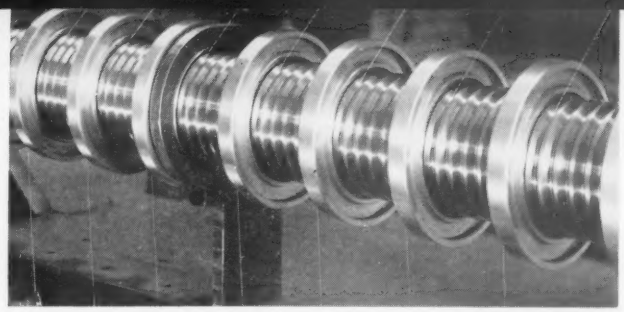
Some of the leading wire manufacturers in the country have seen this machine in full operation in Detroit. They agree: It's a completely revolutionary development in the field of wire enameling equipment.

Here, in picture-caption form, is part of the story. For complete information, fill in the handy coupon on the next page.

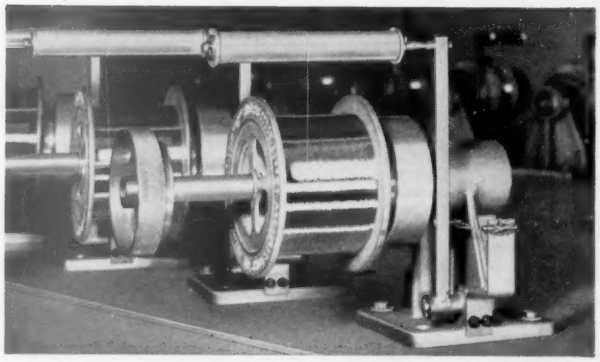




A catalyst is installed within the recirculating stream. Solvents are consumed as they are liberated. They are transformed into usable B.T.U.'s thus reducing the amount of energy from the heat source (either gas or electricity). Results: economy, odor-free exhaust, condensate free stacks, greatly reduced fire hazard.

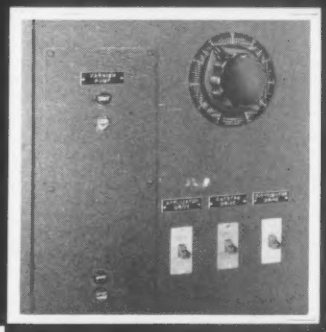


Each head of the wire capstan assembly is fitted with individual clutches at the capstan. Any or all of the lines can be started or stopped without affecting the remaining lines. Each strand is individually driven through the oven, lessening the overall tension applied to each line.



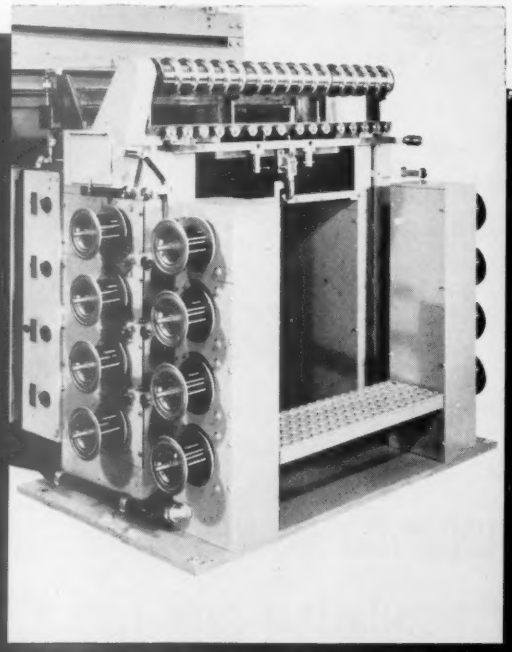
The bare wire pay-off mounts are rigidly mounted at a convenient operational height at the top of the oven. Wire tension is controlled by an automatic braking device.

The centrally located, efficient oven control panel makes operating the oven considerably easier. Experienced engineering has incorporated the ultimate in workmanship, simplicity and safety.



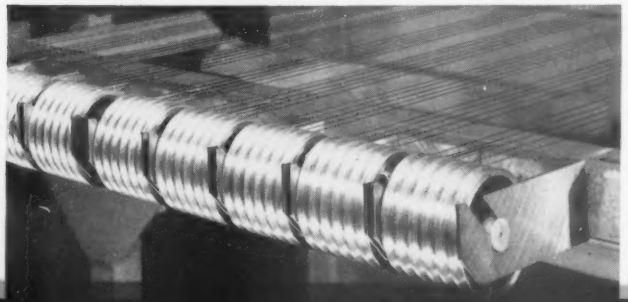
This finger-tip wire control panel brings the capstan and varnish handling equipment into a central point easily accessible to the operator.

Individual torque motor rewinds with micro-adjustment power stats. A simple arrangement of the rewind spools on the console allows easier spool changes even at the high speeds in which the unit operates.



The take-up spools on the unit console are driven by separate torque motors with individual trimmer power stats. All are controlled by a main power stat which also controls a reciprocating wire distributor with adjustable stroke length for laying uniform layers of wire on the spools.

Below: Precision-grooved sheaves with graduated depths of machined aluminum have free-turning nylon bearings.



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425 Brainard St. • Detroit 1, Michigan

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Please send complete information on the new Type "B" MOCO Wire Enameling Machine.

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NEW ANACONDA 15 KV UNGROUNDED-NEUTRAL CABLE

Construction: 3/C 500 MCM copper; strand shielding; insulation of 18/64" natural ALATHON polyethylene; semi-conducting resilient tape; tinned-copper shielding. Conductors cabled with suitable fillers; copper binder; cable tape; 7/64" inner jacket of high-molecular-weight, black ALATHON polyethylene; aluminum interlocked armor; 9/64" outer jacket of same ALATHON as inner jacket. *Anaconda Wire & Cable Co., New York, N. Y.*

Anaconda power cable is lighter, more compact with insulation and jacketing of Du Pont ALATHON®

This new cable construction, insulated and jacketed with ALATHON polyethylene resin, has a smaller diameter than other non-leaded cables – less weight than leaded cables. The minimum weight results in lower shipping and installation costs plus easier handling. Du Pont ALATHON provides protection against moisture, oxidation, chemical exposure and mechanical damage.

The characteristics of Du Pont ALATHON polyethylene resin, used for insulation and jacketing, contribute to many of these advantages. ALATHON has an extremely low power factor and dielectric constant and, therefore, low dielectric loss. Negligible heat due to dielectric loss means that, compared with other insulations, a cable insulated with ALATHON pays dividends every year in load-carrying capacities – as much as $100 per year per thousand feet.

ALATHON permits a higher current rating than other materials with the same temperature limitations because its thermal conductivity is greater – about twice that of rubber.

Perhaps you can take advantage of this valuable combination of properties. Further property and application data are available by clipping and mailing this coupon.

There is a difference in polyethylenes—

specify **ALATHON®**

polyethylene resin

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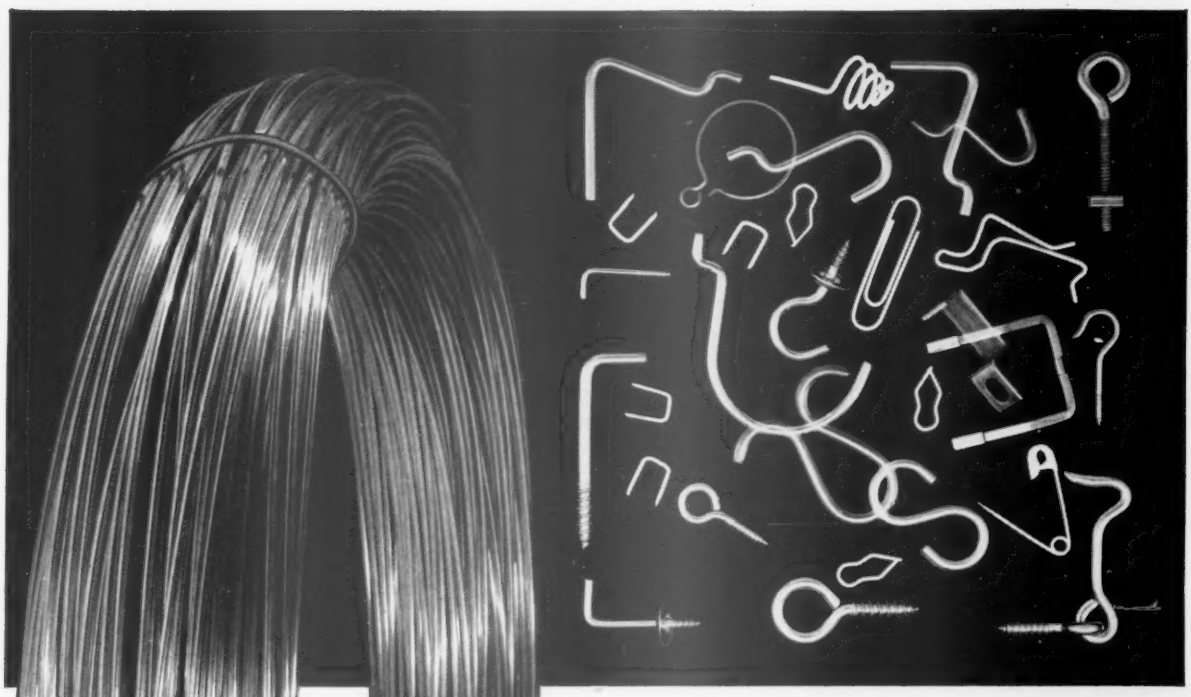

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When specs are tough, requirements rigid, savings essential, fabricate your parts with United Wire . . . aluminum, brass and copper alloys including 10-12-18% nickel silver. Here are the big important things you'll find in United Wire:

- Commercially bright — reduces finishing cost after forming.
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Your "Wire Forms" can be fabricated easier and better at high speed production with low or no scrap loss by using "United" round or shaped wire.

UNITED WIRE
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PROVIDENCE 7, RHODE ISLAND

ALUMINUM, BRASS, COPPER WIRE AND TUBE - BRAZING ALLOYS AND FLUXES

Someday the coat worn by this mink will sell for perhaps $70. Her pelt, known as cerulean mink, along with some 65 others, may go into a full-length coat tagged as high as $10,000.

Bethanized wire guards her $70 mink coat

When stylish, light-colored mink fur shows the slightest trace of rust stain, its value may be cut in half. This downgrading of the pelts—and the constant replacing of the rusted wire pens—adds up to a big loss for the mink ranchers.

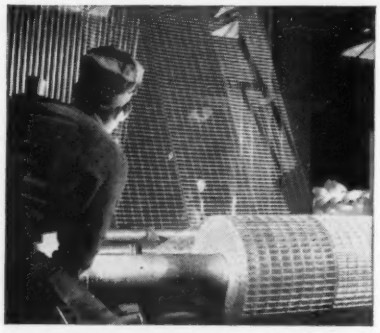
Mink pens made from ordinary galvanized steel wire just won't hold up under the abrasive wear of the animal's feet and the harsh corrosion caused by their body acid. Some years ago a manufacturer of welded wire fabric, was asked by a nearby rancher to see if an answer could be found.

It was decided that bethanized wire with an extra heavy coating of pure zinc would do the job if anything could. Some experimental pens were placed in service using the bethanized "C" coating. And after several years of normal use, it was obvious that the answer had been found. There was not one rust spot on the bethanized wire. And subsequent results have verified this test. As a result, more and more fur ranchers are enthusiastic users of fabric made from bethanized wire.

* * *

Bethanized wire has a smooth, uniform coating of pure zinc which is deposited electrolytically. In our unique process the zinc goes on atom by atom. There are no thin spots for corrosion to attack. Because of its 99.9-pct purity, the tightly bonded zinc is highly ductile and withstands severe forming.

We can supply bethanized wire in hard or soft temper, with light, medium, or heavy zinc coatings. We'll be glad to send you Folder 615 which gives more details. Write Publications Dept., Room 1037, Bethlehem Steel Co., Bethlehem, Pa.



Bethanized wire sparkles as welded-fabric is spooled in 100-ft rolls. This fabric assures long protection against corrosion because the uniform coating of pure zinc is tightly bonded to the steel.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

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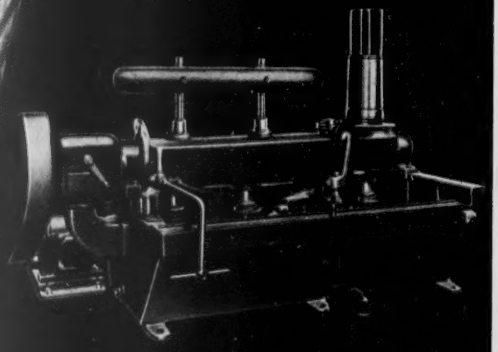

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October 14-17, 1957, LaSalle Hotel, Chicago, Ill.

THE PROGRAM

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Steel men will hear papers on various phases of heat treating, on wire drawing and packaging, on wire problems and a symposium on wire cleaning and plating.

Non-Ferrous mill men will be given a full schedule of papers on extrusion equipment, insulating materials, wire drawing, stranding, diameter control and other pertinent subjects.
In connection with these sessions, appropriate new motion pictures will be shown.

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THE WIRE ASSOCIATION

RICHARD E. BROWN, *Executive Secretary*

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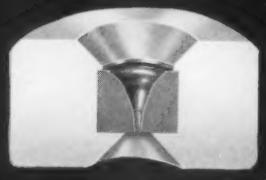

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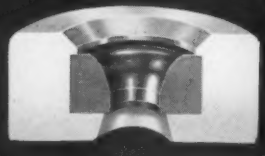

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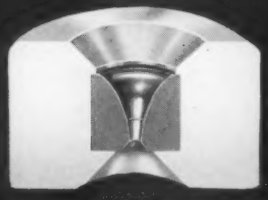

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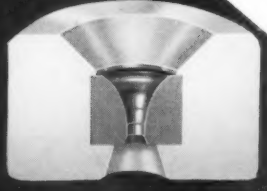

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The Wire Outlook

The forces of the laws of economics can no more be denied in the running of governments than in the conduct of the affairs of individuals.

Back in 1934 we went off the gold standard and started taking a long series of inflationary steps, the effects of which are still operative. We acquired a public debt that was larger for many years than the national income . . . a policy of increasingly heavy taxation was established . . . a war, inflationary in itself, added to our burdens . . . top heavy government payrolls and wastefulness of material resources and income became a fixed routine . . . tampering with the value of the dollar . . . putting the government into business in competition with private enterprise . . . these, and many other political actions, had established a basis for an almost unending series of upward spirals.

But behind all the manipulations and regulations designed to offset the natural laws of supply and demand, was the unparalleled public debt—it still haunts us and will continue to until it is made to assume a reasonable relation to our national income. The end is not in sight, we are convinced, for in spite of measures to mitigate conditions, inflation will continue apace, since man-made measures can never entirely counteract Old Man Economic Law, except for a brief space of time.

The country has been fortunate to have had an aroused citizenry react at the polls in 1951 to the fact that all was not well—even though most of them probably never understood the full significance of the artificial forces that had been set in motion. In 1952 began an effort to correct some of the past errors. The bad practices of two long decades, however, are not overcome in a day, nor are all persons fully convinced that the New and Fair Deal policies were not right. Wanting something for nothing has become a habit for many.

Through this period great numbers of people, little ones and big ones, came to depend upon government for help and counsel that were properly matters for individual decision. We saw business men leaning on Congress, special interest groups, from veterans to farmers, expecting—and getting—government aid, labor demanding —and getting—special privileges that have resulted in abuses, and lobbying on the part of industries for preferential treatment to an extent never known before.

Where does it all lead? To additional inflation until such time as the government and its many agencies cease to be extravagant, until the day when government paternalism is checked and until we all learn to stand on our two feet as did our fathers.

Putting the national house in order is a long, tedious task, with political opposition at every step to any limitation of the government to its legitimate functions. Strenuous efforts are being made to cut Federal expenditures and to the degree that they are successful and excess collections are utilized to reduce the debt, to that degree will the basic pressure on inflation be lifted.

Writing on the subject of the debt and its effect on inflation in September, 1946, this column stated: "Therefore, do not be alarmed unduly when the next wave of wage and price increases strike us and if you find that a car that cost $1,000 in 1940, will cost you $3,000 in 1950—your income at that time will be in proportion to the car's price." We have passed that point now.

We live in a great country. Nowhere else in the world is there the same combination of freedom of expression, freedom of worship and freedom to work at the jobs we prefer. Nowhere else is there quite the same dignity and justice for the individual.

Let us strive to keep it so!

Edmund Duval Sickels
EDITOR

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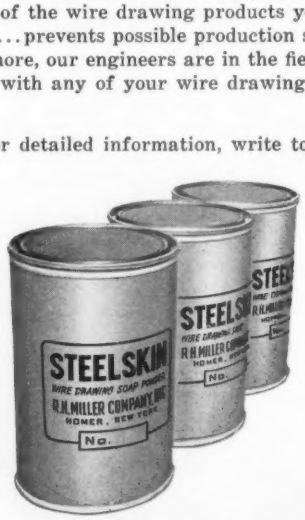

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Vol. 32 AUGUST, 1957 No. 8

The Wire Association Pacific Coast Regional Meeting 1957

June 13th and 14th in San Francisco were signalized in the annals of **The Wire Association** by the holding of a two-day Pacific Coast Regional Meeting for the first time.

* * *

In attestation to the good judgment of the Planning Committee, the meeting was hailed by those who were in attendance as highly successful. It was considered the best attended and best handled meeting ever held in San Francisco and at a meeting of the Planning Committee and Association officials following the close of activities, it was voted unanimously to continue the same general type of program at the Pacific Coast Regional Meeting in Los Angeles in 1958.

* * *

V. A. (Vic) Barbata of Bethlehem Pacific Coast Steel Corporation, San Francisco, served as Chairman of the 1957 Planning Committee, assisted by **Lloyd W. Albright,** Pacific Coast Division of the Colorado Fuel and Iron Corporation, **D. H. Hadsell**, Columbia-Geneva Steel Division of the United States Steel Corporation, **John S. Hawley** of the E. H. Edwards Company, **A. B. Krieder** of the Bethlehem Pacific Coast Steel Corporation and **William Mohr** of the Colorado Fuel and Iron Corporation

Thursday, June 13th

Registration started at 10:00 A.M. in the lobby of the Fairmont Hotel and continued throughout the day.

* * *

There was a total registration of 209, all told. 155 persons attended the technical sessions, 140 men went on the plant inspection tour and 203 were present for the dinner at the close of the second day. It is interesting to record that a large number of persons from the East journeyed to the Coast to attend this meeting—the first time that so many Eastern wire men have come to a Pacific Coast meeting.

V. A. Barbata, Chairman
Planning Committee

The Technical Sessions

Two timely panel discussions were held starting at 2:00 P.M. on Thursday.

* * *

The first was on the subject of "Handling, Packaging and Shipping of Wire Products." With **Lloyd Albright** serving as Moderator, the speakers and their subjects were "New Methods of Mill Packaging" by **Edwin H. Migge,** Colorado Fuel & Iron Corporation; "Handling and Storing Wire Products" by **H. L. Rothwell,** E. H. Edwards Company; and "Mill Finishes" by **R. T. Merrell,** Columbia-Geneva Steel Division, U. S. Steel Corporation. Under Mr. Albright's able guidance a lively discussion followed the paper presentations.

Fig. 1—Operator in control pulpit of Morgan Rod Mill, where 600 pound billets are converted into 5,000 foot coils of rod.

A second panel discussion, led by **A. B. Krieder** as Moderater, was devoted to "New Developments in Wire Mill Machinery." Subjects and authors were "Wire Drawing Machinery" by **Eugene Daugherty,** Vaughn Machinery Company; "High Convection Wire and Rod Annealing" by **J. M. Miskovich,** Lee Wilson Engineering Company; "Welding Machinery" by **F. B. Stone,** Stryco Manufacturing Company; and "What's New in Wire Straightening and Cutting" by **F. H. Rybak,** The Lewis Machine Company. These papers also resulted in a good discussion period.

★ ★ ★

No official activities were scheduled for Thursday evening.

Friday, June 14th

The registration desk opened at 8:00 A.M. for the benefit of those not able to arrive for the Thursday activities.

Busses left the hotel at 10:00 A.M. for Pittsburg, California, for the tour of Columbia-Geneva Steel Division's rod and wire mills. Those going on the tour were the guests of Columbia-Geneva Steel for luncheon shortly after their arrival.

★ ★ ★

The Pittsburg Works of this U. S. Steel division is one of the most diversified wire mills in the country. Its roots go back into the early days of California's development as an industrial state, as a predecessor company pioneered here in the production of wire before the turn of the century.

★ ★ ★

In the course of the trip through the plant, visitors were conducted through the open hearth shop, the rolling mills, the rod mill with its modern Morgan mill, the wire mill and the rope mill. Added to these they saw the manufacture of end products, such as nails, fencing, baling wire and a variety of other products. The company also ships a considerable volume of wire to other manufacturers to be fabricated into finished wire products. Some of the equipment seen on this tour is shown in the accompanying pictures.

★ ★ ★

Altogether, the plant tour was a most rewarding and profitable experience. For the courtesy of the luncheon and the opening of the plant to our members, the Association's Board of Directors is deeply grateful to Columbia-Geneva's officers and executives.

Fig. 4—A battery of Glader nail machines turning out nails by the ton in the nail room. The row of machines is one of many at the Pittsburg Works.

The Evening Program

From 6:30 to 7:30 P.M. the Planning Committee had provided a hospitality hour, during which refreshments were served. Music for the occasion was provided through the courtesy of the **R. H. Miller Company** of Homer, N. Y.

★ ★ ★

A call to dinner at 7:30 P.M. moved the gathering to the Terrace Room for dinner. After the repast, with **Vic Barbata** as Master of Ceremonies, some forty door prizes were distributed to those whose numbers were drawn. These had been contributed by different industrial concerns from all over the country.

(*Please turn to page* 935)

Fig. 2—Billets, after being given roughing and entering passes, enter these finishing stands. Picture shows operator adjusting a roll.

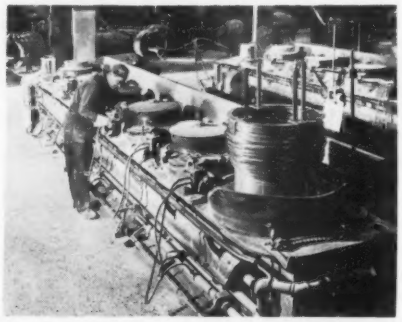

Fig. 3—Vaughn water-cooled continuous drawing machines drawing wire for nails. Here the operator is checking wire diameter with a micrometer.

Fig. 5—Fence making at the Pittsburg Works is big business. Much of the fencing made here will be sold to Western ranchers.

New Methods of Mill Packaging

by Edwin H. Migge
Colorado Fuel and Iron Corporation
South San Francisco, California

This paper was delivered as a part of the Panel Discussion on the subject of "Handling, Packaging and Shipping of Wire Products" at the Pacific Coast Regional Meeting of The Wire Association in San Francisco, Cal., on June 13, 1957.

Mr. Chairman, Mr. Moderator, members of the panel and gentlemen. I have been invited to talk about New Methods of Mill Packaging with some remarks on palletizing.

★ ★ ★

Progress in packaging, coupled with Industrial Modern Research, has brought about the present encouraging conditions of packaging methods now prevailing throughout the Wire Industry of our country.

★ ★ ★

I believe that progress in packaging is a continuous and daily strive for economy. The elimination of the now costly factors involved, can be accomplished by applying more efficient operations; by remembering the factors of non productive storage areas; and by utilization of compact loads in shipping. The result is penny and dollar saving to our producers and fabricators. To effect these results and improvements, the industry is seeking more efficient packaging. For the many improved package methods now in use, an entire horizon of difficult improvements must be accomplished now.

★ ★ ★

One of the many improvements in packaging is palletizing.

★ ★ ★

Our company, The Colorado Fuel and Iron Corporation, at the South San Francisco Plant, has recently equipped our galvanizing department with a bank of twelve Palletizing Packaging machines. These machines can be adjusted to provide wire forming a 16 inch or 22 inch diameter loop. Some of the commodities packaged are binding, stapling, lead annealed, industrial quality galvanized, strapping and bright welding wire.

★ ★ ★

The palletizing packaging operation proceeds by paying off the wire from the palletizer on to a wire constructed stem mounted on a wooden pallet which is placed under the palletizing packaging machine.

★ ★ ★

In order to accommodate a 16 and 22 inch package, two sizes of stems are in order. A 16 inch stem is composed of two lengths of 3/8 inch straight and Cut wire and six inside braces. The lengths are formed to a U shape leaving six inches on both ends to be bent outward at right angles for mounting on the pallets. Form wire and braces are pre-determined as to lengths.

★ ★ ★

After the completion of the forming process, the two lengths or frames are now placed one over the other, so that the tops are centered and are at right angles. The stem is then braced by spot welding three pairs of 3/8 inch lengths to the inside diameter of the frame spaced to give maximum strength. The 22 inch stem is accomplished by the same methods, but naturally by using longer dimensions.

★ ★ ★

The stems are mounted on 19 and 27 square inch pallets respectively and secured at the base with staples. The pallet stringers consist of finished 2 x 4 material.

The stems are now filled with specified commodity and size to weights of 600 to 800 pounds per stem. Prior to shipping, the package is firmly secured with two opposing band wires and properly identified.

★ ★ ★

The advantages of this type of packaging are several fold:

First: They are non-returnable.

Second: They can be profitably used to replace pay off reels by cutting the top two cross pieces and flaring them out to regulate the flow of wire. Flared bonnets or monkey tail pay off devices can also be mounted on top of the stem.

Three: The packages contain larger quantities of wire eliminating time and production loss from frequent string ups.

Four: Less area is required for storage.

Five: The end of the wire is more readily observed in open stem packaging.

★ ★ ★

Another not too recent, but increasingly popular process in the wire industry, is the packaging of the baler wire.

★ ★ ★

Some years ago, during the infancy of the development of the automatic haypress, many sizes, shapes, and weights of wire were shipped to the fields to bale hay. Some bundles of wire worked in a haphazard fashion, other bundles worked fair, but recollection does not reveal that a truly satisfactory conclusion to the involved problems was enjoyed by either the manufacturer or the farmer.

★ ★ ★

The wires either broke or tangled when paying off. The bundle weighed too much or too little, or it became rusty enroute or rusted before being used. Some attempt at that time was made to improve the product by protection with paper wrapping. This was not

entirely satisfactory when material was exposed to dampness, as often was the case.

★ ★ ★

Today, a neatly spooled product is placed in a firm uniform and moisture resistant carton, containing approximately 100 pounds of spooled wire. Extra caution against moisture is taken by completely enclosing the wire spool in a heavy wax paper before packaging. The farmer is also faced by a storage problem at times and is confronted with the elements of nature in between seasons when wire might even be stored *along side* of the barn. The solutions reported have solved much in convenience and loss to the farmer.

★ ★ ★

A cylindrical fibreboard drum is also used as a method of packaging baler wire. This drum is 8½ inches high and 11¼ inches in diameter. It contains a specified number of feet of wire which fits snugly. The lid of the drum is recessed so that when it is stapled on the top of the carton it is practically moisture proof. The sturdiness of these drums simplify and warrant palletizing and high piling of the pallets. Forty-eight drums can be stacked on a 48 inch x 48 inch pallet by using 4 ft. square ¼ inch plyboards between each layer.

★ ★ ★

Approximately 14,400 pounds, or three pallets of packaged wire, can thus be stored in an area that formerly would store only one third of this quantity of wire. This advantage is valuable when stocking this item between seasons.

★ ★ ★

Another advantage is designed for the farmer in his dispensing operations on the hay press. This drum has a paper sealed 5 inch hole on the top and bottom, and is so identified as top and bottom. This particular carton was developed for a three strand hay press. The mounted dispenser on the press is designed to contain three packages lying in a row on their sides. The seals on the ends of the cartons are broken leaving five-inch circular holes on each end. The back ends of each spool may then be butt welded to the front ends of each successive spool. Less down time due to string ups should be realized through modern packaging.

★ ★ ★

The half-pak is a new development in drum type packaging. It is generally used for specialty wires and provides convenient palletizing for shipping. Eight uniform drums may be set on a 41 inch square pallet, stacking eight on the pallet in two layers. Two 1 by 3 inch stringers are used on each of the four sides of the pallet. These stringers are a precautionary measure to prevent damage to the drums in shipment, serve as a base for stapling, and prevent the strap from slipping off the drums. This makes a compact package of 8 drums weighing approximately 2,400 pounds net weight of wire. Convenient to handle, store, and pay off.

★ ★ ★

Successfully being used is a method of packaging known as ring pile palletizing. This type of packaging has been requested where frequent inventory auditing is required. Twenty specified weight coils are stacked four down and five high on a non-returnable conventional size pallet. Inventories are simplified by counting the number of pallets in stock; also less floor area is consumed by such regulated high piling.

★ ★ ★

One rather unique method of packaging, an import, possibly of oriental origin is the forming of a length of welded fabric material into a cylinder. The bundles of catch weight coils are ring piled over this cylinder to capacity. It is then strapped in several places. The origin of this method may explain the reason for this type of package. Because of peculiar shipping problems a sling, no doubt, is used to load and unload from the hold in a ship. A ram on a fork lift truck is probably used for all other movements, even transportation to the fabricating machine.

★ ★ ★

This ring-pile type of packaging is being used by some of the rod mills without the welded fabric cylinder. Approximately five 700 pound coils of rod are securely strapped in a ring pile. This is a much improved method of packaging compared to the lack of control when single coils are handled. Damaged coils; speed up in unloading of raw materials; neatness in stacking; extra storage due to the compressed package; speed up in servicing the cleaning house; and above all, the improbability of mixing rods or coils of different heats or other specifications, are some of the advantages of strapping rods in multiples to suit your operations.

★ ★ ★

Stone wire, galvanized, black annealed, and liquor finished wire is being packaged in a well identified carton. One carton size is adapted to fit the stone wire size range. The carton was designed to contain six coils of any size. The course sizes of annealed stones fill the carton to capacity, but when the finer sizes are packaged a blank is left between the top coil and the lid of the carton. This has been solved by filling the open space with the proper amount of fibreboard filler cut to dimensions. This solution eliminated stocking of the various size cartons to accommodate the different commodities and established one standardized carton.

★ ★ ★

Oxidation caused by exposure to fumes, dampness, and foreign dust particles has been entirely eliminated by the use of cartons. Many of us remember not too many years ago when we dug into an open barrel, rack, or basket that contained the stored stone wire and found the coils rusty, discolored from fumes and various mill debris that missed the scrap barrel. Mixed wire gauge sizes now are a rarity, rather than a frequent occurrence. In addition, the benefits of high piling are possible by stacking the cartons on pallets or high stacking racks or skids.

★ ★ ★

(*Please turn to page* 932)

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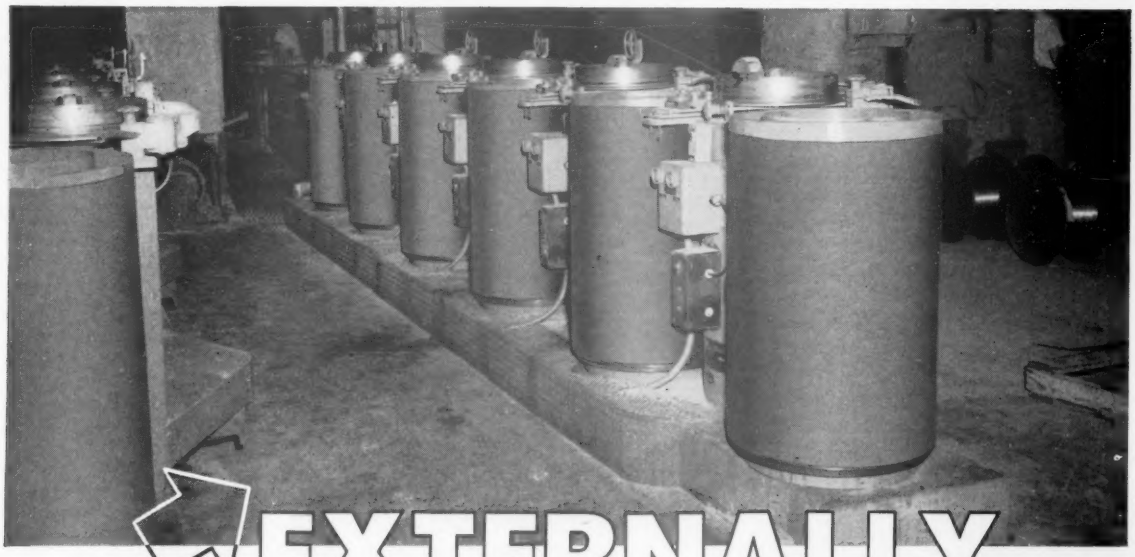

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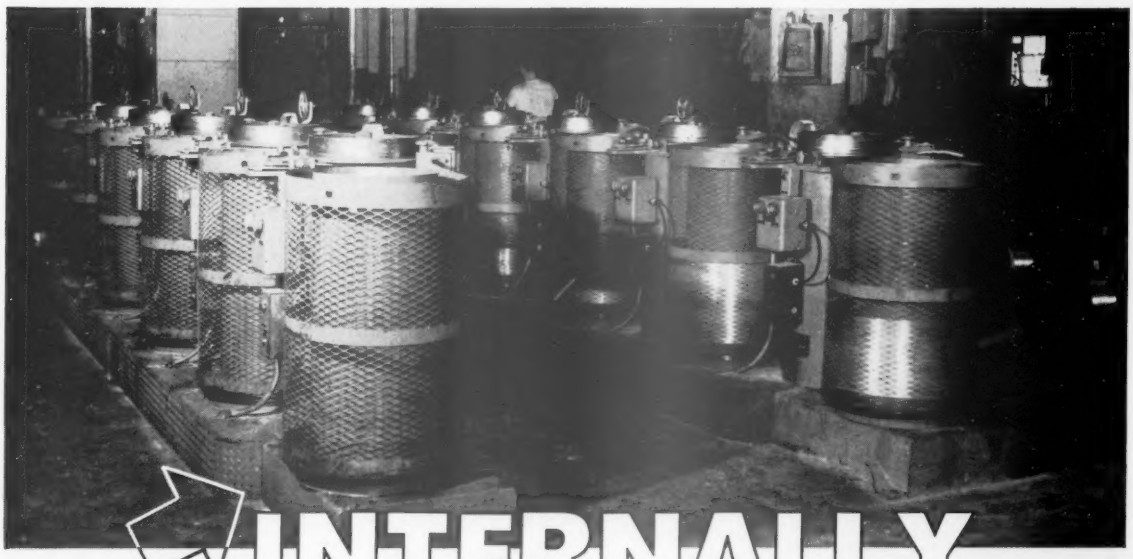

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Handling and Storage of Wire Products

by Herbert L. Rothwell

E. H. Edwards Company

South San Francisco, California

This paper was delivered as a part of the Panel Discussion on the subject of "Handling, Packaging and Shipping of Wire Products" at the Pacific Coast Regional Meeting of The Wire Association in San Francisco, Cal., on June 13, 1957.

The handling and storage of materials is a problem common to everyone engaged in manufacturing and warehousing. I will outline how we manage this function at E. H. Edwards Company, South San Francisco plant. We are a non-integrated mill with a comfortable capacity of around fifteen hundred tons of diversified wire products per month. The factory covers some eleven acres and was laid out some 30 years ago with the handling and storage of materials uppermost in the minds of the builders.

★ ★ ★

The main group of departments handling the bulk of materials both unit and volume-wise is centered around a building-covered craneway some 750 feet long and spanning 60 feet. The west end of this craneway covers one of the two spur tracks servicing the plant and the east end covers one of the three main truck docks. The finishing end of the wire rope mill with its heavy reels of wire rope is also serviced by this crane. The largest reels of wire rope weigh 56,000 lbs. The pot annealing and shipping departments with their heavy lifts are entirely covered by the craneway span. Heavy volume raw materials such as incoming rods are also handled by this crane. The maximum crane travel on rod unloading is about one hundred feet and follow up handling by ram truck travel no more than eight hundred feet. The present job assignment for rod unloading makes it more economical than could possibly be done by a mobile unit unloading from our other spur track that bisects the rod storage area. A gondola car of sixty tons or rods can be unloaded and stored in as little as thirty minutes by our present method.

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The rod storage is an uncovered area serviced entirely by ram trucks stacking rods two rows high to give us up to better than two months' supply. All rods are carefully identified as to chemistry, size, and supplier. Each heat received is quality checked as it enters the plant and classified as to desirable chemistry range and end product possibilities. Twelve general carbon ranges cover rods from .05 to .80 Carbon content. Tighter ranges develop in production planning from these twelve basic classifications. The location of the storage of each heat of steel is carried in stock records and drawn on in full, or part, when stock moves into either the Patenting or Cleaning Departments to start the processing.

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The Patenting Department consists of two lead quench air furnaces. In general one furnace runs eighteen wires of .048″ to .139″ range coiled on 22 or 28″ blocks. The second furnace handles 12 strands of .140″ to .268″ process wire or rods. This second furnace has 40 inch takeoff blocks. Stock feeding to these furnaces is hoist loaded onto either live or dead reels. Butt welding is used extensively.

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The Cleaning Department is semi-gantry crane serviced straight line cleaning installed in 1938. Lime coating, borax coating, phosphate coating or copper coating supply the Wire Mill demands. A small platform truck or a ram truck manage all rods or process wire into and away from the Cleaning house.

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Material delivered to the two Wire Mills is generally of 22 or 28 inch coil stock on frames transported by platform truck, or 40 inch processed wire coils or raw rods handled by ram truck. All but the fine wire benches are stocked by the use of air or electric powered hoists. Unloading draw benches is by electric hoist and onto reels, skids, frames or into bins. Here is where the handling and storage starts to branch out.

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Finished rope wire or trade wire funnels into the Testing Department where the wire is quality checked and graded as per established standards. Some of this wire goes into rope wire storage; some into packaging for shipment, and some directly into the wire rope production. We have some two hundred standard varieties and grades of high carbon wire. The identification of each coil of steel wire is carefully made and records kept for production planning. Each coil of wire has a color coded and numbered tag attached, bearing the lot number, size, strain and torsion test. Any rejected coil carries the reason for its failure to be favorably classified. The work of these wire testers is the final check on all the previous planning and checking along the line of processing that has gone into the development of a sound product.

(*Please turn to page* 929)

Wire Mill Finishes

by R. T. Merrell, Assistant Superintendent
Wire and Wire Products Department
Columbia-Geneva Steel Division
United States Steel Corporation
Pittsburg, California

This paper was delivered as a part of the Panel Discussion on the subject of "Handling, Packaging and Shipping of Wire Products" at the Pacific Coast Regional Meeting of The Wire Association in San Francisco, Cal., on June 13, 1957.

It is fundamental that wire finish is dependent on rod surface quality. Included in good rod surface quality are such items as freedom from surface defects such as laps, seams, slivers and rolled-in scale, close conformance to circular cross-section, and a uniform scale condition.

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Once having received high quality hot rolled rods, the wire mill may adjust one or more of several variables in order to obtain a wide variety of wire finishes designed for certain specific end uses. The first stage in wire mill processing is generally recognized as the cleaning or pickling and coating operation. In this process, scale from the hot rolled rods and/or heat treated process wire is removed by chemical reactions set up by a dilute solution of hot sulfuric acid. Three variables (time, temperature, and acidity) can be adjusted in order to secure proper removal of the scale on the material to be cleaned. The type of stock being cleaned, the cleaning cycles, and the remaining effective life of the acid in the tank are used in establishing the level of time and temperature.

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An additional word on uniformity of pickling may be worthwhile at this point. Certainly there are some inherent differences in the scale condition from one end of the rod coil to the other. It is important to avoid crowding of the coils on the cleaning pin in order to secure uniform pickling. Agitation of the work or of the bath is also beneficial.

This brings us to a discussion on inhibitor practices. An inhibitor may be designated as any substance, usually organic, which retards or modifies the attack of acid on sound metal and directs it to the more resistant oxide or scale. Inhibitor practices are always carefully observed because it is extremely important to provide just the right level of pickling, and at the same time to eliminate those metal losses which are associated with excessive attack on the base metal. An under-pickled stem of rods showing patches of adherent scale represents numerous headaches and scratched wire problems for the wire drawer and the subsequent user. However, over-pickled rod is equally undesirable. Generally, a tenacious black smudge can be noticed on the surface of an over-pickled rod. This smudge, even after rinsing, may well cause scratched and cut-out wire in the wire drawing operation.

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Following pickling, rinsing is the next stage of the cleaning and coating operation. Very careful rinsing to remove all traces of acid, as well as any flakes of adhering scale, is essential in order to ensure a rod product which can ultimately yield a tough wire having the desired finish. In order to achieve maximum cleanliness, high pressure water jets are definitely preferred.

The lime or borax coating operation follows the rinsing treatment. It serves three distinct purposes: (1) since lime or borax is a basic chemical compound, it will neutralize any trace of acid which may remain on the rod or wire; (2) lime or borax prevents the oxidation of the surface of the steel between pickling and drawing, and (3) lime or borax serves as a lubricant and a lubricant carrier in the wire drawing operation which follows.

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The process of coating cleaned rods and wire is purely mechanical, and consists of dipping the cleaned material into a vat containing lime or borax. In order to ensure uniformity of lime or borax coating, it is again necessary to have the coils well opened on the pin. In addition to spreading the coils on the pin, other techniques such as multiple dipping and the use of wetting agents in conjunction with lime suspensions or borax solutions are employed for purposes of attaining maximum uniformity. High temperature of the coating bath provides quick moisture evaporation and prevents undue concentration of coating at the bottom of coils in the subsequent drying operation.

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The consistency of the lime suspension or borax solution is varied according to the number of drafts the wire is to be drawn and the end use of the particular wire product ordered. For instance, a light lime practice is used on rod scheduled for processing to wire for welded fabric, since heavy residual lime adversely affects electrical conductivity.

Following the pickling and lime or borax coating, baking of the coated material is accomplished by placing the rod stems into flash bakers where the temperature is maintained between 400° and 500° F. The purpose of the baking is to dry the lime coating completely and to eliminate any hydrogen which may later result in so called "acid brittleness."

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Having delivered properly cleaned and coated rod to the wire drawing department, the selection of the wire drawing die and the wire drawing lubricants are the next variables which govern the finish of the ultimate wire product. Residual lubricant on the finished wire is determined by the amount of lime or borax picked up during the coating operation, the make-up of the lubricant used at the die boxes, the overall amount of cold reduction, and the contour of the wire drawing die. In the actual cold reduction, a portion of the lubricating medium adheres to the surface and is carried through the die, forming a thin film between the wire and the die. Without this film, direct contact between the two metallic surfaces would result in rapid die wear and injury to the wire. It might be well to add that the residual lubricant on the finished wire product is also beneficial in the various forming operations which are ultimately conducted in customers' plants.

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In the above discussion we have traced the various stages of processing through the wire mill and we have observed that a large number of variables may be adjusted to provide an infinite number of wire finishes. However, to be more specific, it might be well to discuss just what types of finish are available, what are the purposes of these various finishes, and what can be expected when a customer orders wire of a given finish.

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Finishes are generally classified as to whether they are obtained through dry-drawn or wet-drawn methods. In wet-drawn finishes, the contact area between die and materials being drawn is supplied with a liquid lubricant, either by providing the lubricant to the die box or by immersing the entire drawing system in a liquid or spray bath. These finishes are characterized by high polish, and relative freedom from residual lubricant.

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Often a metallic lubricant such as zinc, copper, or a combination of copper and tin is applied before drawing and polished in the subsequent drawing operation. Sometimes these metallic finishes are for decorative reasons; sometimes they are applied to facilitate wire drawing. With the exception of drawn galvanized wire, these metallic finishes should not be regarded as corrosion protective finishes. In the case of copper and tin, these metals serve to promote electrical conductivity and rubber bonding.

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Since wet-drawn wire carries the least amount of residual lubricant, due consideration should be given to the protection of these finishes by paper wrapping and/or shrouding.

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By far the largest tonnage of wire is produced with dry-drawn finishes. In this classification are two sub-divisions: grease-drawn and soap-drawn wire. Speaking first of the grease-drawn wire, it can be stated that such wire is commonly used for those wire products whose end use suggests a minimum of residual lubricant compatible with some subsequent surface treatment and/or spot welding. Included are those products subject to painting, plating, or gluing. Typical examples include coat hanger wire, hog ring wire, etc. In these latter instances, the wire finish must be either immediately compatible with the finishing process or it must lend itself to easy preparation by vapor degreasing techniques. The consistency of the grease mix, the amount of overall drafting, and the contour of the final die governs the amount of residual lubricant. As to the grease mixtures, some are prepared at the mill, and some are purchased as proprietary mixes.

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Soap-drawn wire utilizes powdered lubricant mixtures of lime and metallic soaps such as aluminum stearate, calcium, and sodium soaps. Here again some mixes are prepared at the mill, some are purchased as proprietary compounds.

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Residual lubricant on the finished wire is determined by several factors. Included are:

1. **The amount of lime, borax, phosphate, etc., on the coated rod.**
2. **The make-up of the soap mix.**
3. **The melting point of the soap.**
4. **The reduction per draft.**
5. **The overall amount of reduction in area.**
6. **The contour of the dies.**

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Soap-drawn finishes are applied for a wide variety of end uses; included are products for cold heading and cold extrusion, upholstery spring wire, and a multitude of basic and high carbon wire products. Soap-drawn finishes are not readily removed by vapor degreasing techniques; however, these finishes are soluble in hot dilute acid solutions.

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There are a great number of special finishes which can be produced for specific end uses. Discussion of these finishes may be found in Section 16 of the American Iron and Steel Institute, Steel Products Manual. However, a brief comment will be made here on some of these wire finishes.

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Bright Basic Wire, frequently referred to as "Bright Wire." By common usage over a long period of years, this name has been used to designate a coarse, round, dry-drawn, low carbon, basic open hearth steel wire produced without employing any intermediate heat treatment or special processing for the specific purpose of altering the normal properties imparted by the cold drawing of low carbon steel. In producing small

sizes of bright basic wire, annealing may be employed at an intermediate size, but the purpose of such annealing is only to restore the capacity of the steel for cold work in order to perform the great amount of reduction involved in producing small sizes of wire.

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There are many uses for which bright basic wire serves adequately, but this type of wire is commonly confined to applications that do **not** require a finish other than that obtained by regular dry drawing practice.

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Clean Bright Wire is dry-drawn wire which requires a finish sufficiently clean, bright, and free from surface defects to assure satisfactory performance for such end uses as spot welding, japanning, etc. Although not requiring more drafting, slower drawing speeds are necessary and additional care is required in processing to provide a surface free from excess coating and lubricant. For some applications, a cleaning operation by the user may be necessary.

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Extra Smooth Clean Bright Wire is dry-drawn wire from rods selected with respect to surface characteristics, and produced by varying the lubrication and drafting in order to obtain an extra smooth clean bright surface. This finish is obtainable in all grades of dry-drawn wire and is intended for use where clean, smooth surface is of prime importance in some subsequent operation such as electro-plating, tinning, or similar processes. Particular wire drawing practice, requiring additional drafting, inspection and selection, is necessary to produce this finish.

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Super Finish Wire has a surface finish with a high degree of smoothness and polish, and is used primarily for the production of curtain rods, towel bars and fancy decorative display racks, which necessitates the ultimate in surface perfection and cleanliness obtainable in the base wire. The articles made from this wire are usually electro-plated and require a mirror-like finish without buffing or burnishing of the base metal.

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In order to obtain the necessary surface perfection in this wire, special steelmaking practice is required, which is followed by the careful rolling and surface conditioning from the ingot through the blooms, billets, and rods from which the wire is drawn.

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Coppered Wire and Liquor Finished Wire are normally produced by wet-drawing wire which has been immersed in a copper sulphate or copper-tin sulphate solution. The solution used is dependent upon whether copper finish, brass finish or white finish is desired. The temper of the finished wire is controlled by intermediate heat treatment and wire mill processing prior to wet drawing. Certain coarse sizes of coppered wire are dry-drawn. However, the finish is not comparable to wet-drawn wire.

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Tinned Wire is given a coating of tin by passing single strands through a bath of molten tin. The temper of the finished wire is controlled by processing prior to the tinning operation.

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Galvanized Wire is produced by passing wire single strand through a bath of molten zinc to produce hot galvanized wire or through an electro-plating unit with either soluble or insoluble anodes, depending on the process design, to produce electro-galvanized wire. In the hot dip process, finish depends on wiping technique, temperature of the coating bath, bath purity, speed of cooling, and zinc pot alloy additions. Dull or matte finishes are produced by air cooling a tightly wiped coating. Such finishes are used for tie wire, wire for painting, and for some fences.

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Bright finishes can be produced by rapid cooling, usually by water quenching of the wiped finish. Alloy additions to the pot are also used. Consumer eye appeal is the chief recommendation of the bright finishes. Most commercial electro-galvanized coatings are deposited as a matte finish and subsequently polished as desired by ball burnishing or by light drafting through a wire die. Both processes of coating are capable of further cold reduction and this practice is often used for such products as working wire rope for corrosive operating conditions. Zinc is a good corrosion preventive finish under properly aerated exposures. The extent of protection is roughly proportional to the weight of the zinc coating. Poor ventilation and moist storage or service conditions can result in rapid deterioration of zinc coating, appearance, and short service life.

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Aluminum Coated Wire. So far, this finish has found specialized uses such as in continuous furnace conveyor belts, welding wire, and in some corrosion situations. Surface roughness and the necessity of coating at high temperatures has limited its application.

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Annealed Wire is wire which has been softened by heating to relieve the hardening effects of cold drawing. The methods of annealing wire and resultant finishes are as follows:

a. Pot Annealed Wire or Black Annealed Wire is produced by heating the coils of wire in pot or bell furnaces followed by slow cooling. The black oxide or scale will resist rusting to a limited degree.

b. Lead or Strand Annealed Wire is produced by passing wire in single strands through a bath of molten lead, or through open fired furnaces, followed by air cooling. This product is not as soft as pot annealed wire and is used for bale ties or bands and for other articles requiring greater strength or stiffness than that possessed by pot annealing.

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This discussion has briefly considered some of the finishes now existing in the wire industry. Some are a result of a necessity in the wire making procedure, some are required for subsequent manufacturing and end use service. As

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Wire Drawing Machinery

by Eugene Daugherty, Vice President
The Vaughn Machinery Company
Cuyahoga Falls, Ohio

This paper was presented as a part of the Panel Discussion on the subject of "New Developments in Wire Machinery" at the Pacific Coast Regional Meeting of The Wire Association in San Francisco, Cal., on June 13, 1957.

We want to thank the Program Committee for singling out our company to participate as a panel member to discuss "New Developments in Wire Machinery." We consider it an honor and a privilege to have been invited. The part we have been asked to discuss is "Wire Drawing Machinery."

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Before barging right into new developments, it may be well to review some back history of wire drawing machinery to show how the new developments have come about since at least the turn of the present century.

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During the entire period before the 1920's, practically all steel wire, both low carbon and high carbon, was drawn a single hole at a time at what we now consider very low drawing speeds, 300 to 350-FPM. This was done on Wire Drawing Frames.

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The frames consisted of wood construction and later structural steel construction with a line shaft extending the full length of the frame driven from one end by a suitable AC motor and drive. The blocks were driven by means of bevel gears having cast teeth or cut teeth and jaw clutches. Coil clutches and friction clutches were also used to a limited degree. Bundle weights were about 165-lbs. and chilled iron dies were most generally in use, although some alloy steel die plates or "wortles" were coming into use particularly for the finer sizes of wire. The dies or plates were made and shaped by the operator himself by means of special hand tools of his own contrivance and at the best the dies would last only for one or two bundles of wire before wearing out of tolerance.

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Bundles were handled to and from the blocks by hand which proved to be an arduous, back breaking job. Block Stripping Spiders were later added to alleviate the manual fatigue.

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During this period it was the consensus of opinion that it was not possible to draw good wire at speeds in excess of 300 to 350-FPM. One reason for these low speeds was in the equipment itself, primarily because of the shock when the block was dropped onto the jaw clutch, which snapped off points at higher speeds. The friction clutch was introduced, but it was not uniformly successful.

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The first real attempt to give the wire industry a tool whereby wire drawing speeds could be increased was the introduction, in 1924, of the Vaughn Motobloc. This is a very simple machine with an adjustable speed, direct current, motor driving a block through a set of worm gears with anti-friction bearings all mounted on a common base plate. By the use of DC, very slow starting speeds were obtained which eliminated the point breakage, and the automatic gradual acceleration to preset drawing speeds enabled much higher drawing speeds to be obtained. Dynamic braking, obtained through the use of DC was also a big feature, enabling quick stops electrically from the higher speeds, without the application of mechanical brakes.

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With this machine, wire drawing speeds were immediately jumped up from 300 and 350-FPM to speeds of 900 to 1000-FPM.

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At about this time accumulative type continuous wire drawing machines were having some success in Europe and were brought over to this country, but bear in mind, small bundles and chilled iron dies were still in use. Because the Motobloc could rip the rods faster and the operator could adjust his intermediate and final drawing speeds to suit his handling capacity of bundles from block to block, one man could produce more wire on a battery of 4 Motoblocs, say in drawing #13 gage wire from #5 rod, than he could on one 4-block Continuous Machine. This was because of the length of time required to string up a bundle of wire on a continuous machine and the fact that it was necessary to string up each bundle because the chilled iron die would wear off tolerance on each 165-lb. bundle or two.

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It was a terrific job to sell this machine to the wire industry on account of its extra cost and the application of DC power, particularly because DC power was on the way out electrically, due to transmission costs. However, the machine proved itself production wise and cost wise, and today, one can hardly find a wire mill, especially a steel wire mill which does not use DC power for its wire drawing operation.

In about 1933, the carbide die came into the picture. This immediately made continuous wire drawing profitable. Note, I said profitable—not possible. Welding of the ends of rods together also was developed which further enhanced continuous drawing. With the wide acceptance of the direct current Motoblocs it was a logical step to combine the individual motor principle into a machine of multiple spindles, suitably geared, with a tension arm between each machine, around which a loop of wire was used to control and regulate the speed of the follow motor to the speed of the wire being drawn. Thus, we obtained a truly continuous machine with no accumulation, no twist in the wire from block to block and no slip between the wire and the block.

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The original mounting was a flange motor with the worm as an integral part of the motor shaft. The first continuous machine (Motoblox) was designed for low carbon wire only and for operation on 230-volt constant potential DC power obtained from a common source or from shop lines.

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The machine was air cooled only by means of an air ring around each block, plus a blast of air directed through passages in the block itself.

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It was designed for finishing speeds up to 1200 to 1400-FPM with a fairly narrow range of final drawing speeds.

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When the Motoblox was applied to the drawing of high carbon wire, additional cooling of the blocks was indicated. Internal water cooling of each block was then added in addition to the external air cooling.

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Flange motor mounting was improved with a flexible coupling between the motor and the worm shaft.

As increasing speeds for both high carbon and low carbon wire were being called for, the speed range of the machine, as well as its top speed, was increased by the use of adjustable voltage direct current power. This was accomplished by the use of one large generator to supply the required adjustable voltage to all motors of a single machine. Additional HP was obtained in the same frame size motor by increasing the voltage. Speeds up to 2500-FPM for low carbon, and 2000 to 2200-FPM for high carbon wire were obtainable.

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These greater speeds meant that better guarding of the machine had to be provided for safety reasons. Thus, finishing block guards and front safety guards were added.

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Applying adjustable voltage to the DC power source indicated that still greater wire drawing speeds were possible, and could further reduce manufacturing costs; but it was found that as speeds increased, unstable wire drawing conditions were encountered, particularly at high speeds and light loads. To overcome this, booster generators (one for each block) were introduced in addition to the large main generator, but this was found to be much too expensive and difficult to regulate. Continued study and cooperation with one electrical manufacturer resulted in the development of our latest and most up-to-date machine.

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The power source now comprises an individual adjustable voltage motor-generator set for each motor of the machine, instead of one large generator for all motors of the machine. Enough room was available between the motors of the machine to mount a small high speed motor-generator set beside each motor, without taking up much more room for the machine, and at the same time, to mount the control for each motor above the motor, thus enclosing all the electrical equipment for each motor in a ventilated cabinet at the back of the machine.

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The control is now almost completely wired at our factory, and customer saves a considerable amount of electrical installation costs. Over-all floor space is also saved because a separate room or floor space is not required for a large M-G Set and its starter and the control. With this arrangement we obtain:

1. Increased wire drawing speeds (especially true when spooling is used in conjunction with the machine).

2. Wider range of drawing speeds.

3. Greater flexibility as to die set-ups.

4. Increased stability at high drawing speeds and light loads.

5. Increased portability of machinery.

6. Simplification of electrical spare parts.

7. Generally greater continuity of operation.

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Currently, 6-hole machines have been built for speeds up to 4000-FPM. Several variations of Motoblocs and Motoblox are also available such as:

Double Deck Motoblocs, without cooling and with both air and water-cooling or either.

Single Deck Motobloc with "Push-up" block, in which the flange of the block is a separate piece mounted on an angle to the vertical axis of the block. In this case, the flange pushes the wire up the block, whereas on the conventional block, with the flange an integral part of the block, the incoming wire from the die pushes the wire up the block.

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This push-up block feature is particularly suited for drawing squares, flats and shapes. It can be supplied with oil cooling.

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4-HRX (Quadruplex) Motoblox. This machine is a variation of our Continuous Motoblox for either single hole drawing on each block, and/or continuous drawing on 2, 3 or 4 blocks. On this type machine, the die holders are mounted

in front of each block for single hole drawing; otherwise, it is the same as standard Motoblox. This machine represents the utmost in flexibility.

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6-HRX Conventional Motoblox is the largest machine of this type built to date. This machine was designed to draw .192" bridge wire from ⅜" high carbon rods. It has 30" diameter blocks all the way through, with extra cooling capacity, both air and water, and each motor on each block will develop 98-HP at the high DC voltage. Top speed is around 1100-FPM. Actually, the bridge wire is drawn at a finishing speed of from 800 to 850-FPM.

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7-HRK Motoblox. This is a brand new continuous machine, air and water-cooled for high carbon material, with all blocks, except the finishing block, mounted on horizontal shafts instead of vertical. This machine has been designed for straight through drawing from block to block, without the use of tension arms between each block. Of course, the electrical equipment for such a machine is considerably different from the electrical on the conventional Motoblox.

New Auxiliary Equipment in Conjunction with Wire Drawing Machines

1. For drawing heavy steel wire, single hole, sizes ½" to 1⅛" diameter, the following equipment is needed:

3-Roll Straightener, to mechanically straighten out a section of the coil so it can be handled to the pointer and through the die box more easily.

4-Roll Pointer Extra Heavy, consisting of 2 vertical and 2 horizontal rolls for ease of pointing without twisting the rod, capable of pointing 1¼" diameter rods.

Positioning Floor Reel. A better means of feeding material to the Motobloc.

Inverted type Motobloc. Not yet made but proposed, for better method of handling the heavy coils, which would be dropped or unloaded onto a conveyor, instead of present method of lifting from block by means of a stripping spider or hook.

2. For Standard Motoblox:

Collapsible Riding type Stripping Spiders with hold-down latch and dumping device, for drawing large bundles up to 3000 and 4000-lbs.—depending on size of finishing block and size of wire being drawn.

1000-lb. capacity Motor-driven Spooler used in conjunction with Motoblox. Electrical tied in with electrical of Motoblox.

6/7-HIV Motoblox with 1000-lb. capacity Motor-Driven Spooler.

Double Spooler for producing cardboard core flangless spools.

Stationary Block, separately motor-driven, used in conjunction with wire drawing machine, and also for galvanizing and perhaps patenting.

Auxiliary Equipment Other Than That Used in Conjunction with Wire Drawing Machines

Conventional Patenting Take-up Frames should have:

Individually motor-driven vertical push-up type blocks, for pulling wires through patenting furnaces. 1000-lb. capacity. Also has been made for 3000-lb. capacity. Riding type Stripping Spiders for same.

Individually motor-driven vertical push-up type block for galvanized wire, with riding type Stripping Spiders. 300 to 600-lb. capacity on 16", 20", 24", and 26" diameter blocks.

16" Block Take-up Frame for galvanized wire, push-up type.

40-wire inverted block type Take-up Frame.

48" diameter inverted type Take-up Block.

Rod mills are now rolling as high as 1200-lb. bundles and the trend is for larger and larger bundles to be processed through patenting, cleaning and drawing, and also galvanizing. A recent request for equipment to pull high carbon rods through a patenting furnace and take up in 5000-lb. coils, led us to design a radically different type Take-up Frame employing 48" diameter inverted blocks. This slide shows the general arrangement of the proposed frame of 40 blocks. It will be noted that the entire frame would be built on an overhead structure. Full 5000-lb. coils of rods would be dropped by gravity directly onto ram trucks or onto storage pin racks for subsequent handling by ram trucks.

None of these blocks or frames have been built to date, but this indicates the thinking which is going on in this phase of the wire business.

Stationary block for galvanizing with provision for rotating also.

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All equipment discussed so far has been mainly for steel wire, both high carbon and low carbon. A considerable amount of new equipment has also been developed during the past 5 to 10 years for non-ferrous materials, copper, aluminum, brass, etc. These types of wire drawing machines are for the most part slip type machines. Most of the improvements have to do with the trend toward tandem type machines as against cone type machines. Many of these machines are operated electrically from alternating current power sources, although the more recent types of drives are more and more for electrical operation on direct current.

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Wire drawing speeds in general for non-ferrous materials are greatly in excess of speeds for steel, for a number of reasons, and take-up on spools is almost universally the case.

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Another machine is the new 10-DST, 10-Die Standard Tandem Continuous Machine with a 1000-lb. separately motor-driven spooler. These machines are made for top speeds of 6000 to 7500-FPM. They are slip machines with wet lubrication for the wire and dies —oil is used for aluminum and its alloys, and soluable water soap solutions for copper and brass. Lubrication is generally pumped from a central solution system holding enough solution to lubricate and cool several machines. The 10-DST Machine is the rod breakdown machine handling ⅜" diameter aluminum rods and/or 5/16" diameter copper rods, down to sizes as low as #14 B&S (.064" diameter) wire. A heavier version of this machine is also made, termed a 10-DSTX Continuous Machine, which will handle starting size of ⅜" diameter copper rods. While the photographs show a 1000-lb. capacity spooler in conjunction with the drawing machine, 4000-lb. spoolers are also regularly being supplied such as spooler shown on the next slide.

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For the intermediate and finer sizes of copper and aluminum wire, a line of Circular Tandem Ringblox was developed. These machines are made in 4 different sizes; a 13-Die CI and a 9-Die CIX machine for the coarser range of inter-

(*Please turn to page* 942)

Fine Craftsmanship begins with

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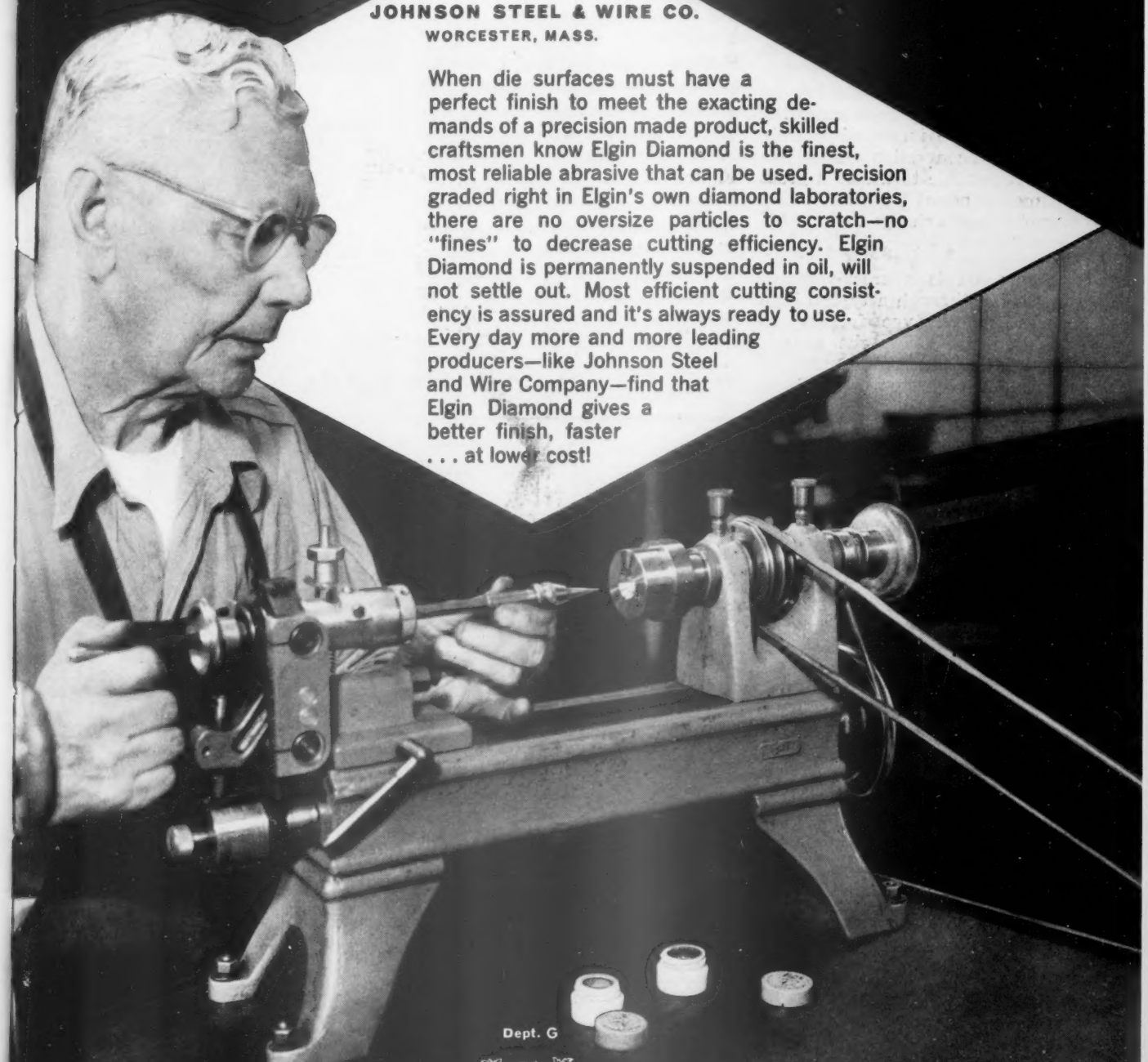

Dept. G

ABRASIVES DIVISION

ELGIN NATIONAL WATCH COMPANY

ELGIN, ILLINOIS

High Convection Wire and Rod Annealing

by J. M. Miskovich
Lee Wilson Engineering Company
Cleveland, Ohio

This paper was presented as a part of the Panel Discussion on the subject of "New Developments in Wire Machinery" at the Pacific Coast Regional Meeting of The Wire Association in San Francisco, Cal., on June 13, 1957.

The purpose of this paper is to describe the application of extremely high velocity gas recirculation, known as high convection, to the annealing of rod and wire coils. The application of this high convection system has enabled the fuel inputs to bell type annealing furnaces to be increased sharply as the high convection system has made it possible to utilize a great deal more heat by convection transfer to the charges.

★ ★ ★

Figure #1 is a cross-sectional view taken through a typical high convection bell type furnace installation and shows the general construction and arrangement of furnace bell, inner cover and base. Heating is accomplished by means of oval type radiant heater tubes arranged so that the vertical legs of the tubes are uniformly spaced in a ring around the charge. **Figure** #2 is a view taken at the bottom of a furnace looking upwards, and shows the oval type radiant heater tubes in the furnace. The heat from the tubes is transferred through the inner cover and into the stream of high velocity gases and the charge. The movement of this gas requires a very high capacity, high pressure fan, which in these furnaces, moves approximately 8,000 to 10,000 cubic feet per minute of gas at 10″ total pressure directly and approximately the same amount by induced flow.

★ ★ ★

The heart of the high convection system is a turbine type fan wheel, and the combination charge support and diffuser assembly, which efficiently distributes the flow from the fan. **Figure** #3 shows a top and sectional view of a diffuser assembly with the fan wheel in place. A number of curved vanes expand the gases gradually and efficiently in their travel from the fan wheel to the outer edge of the assembly. At the tip of each of

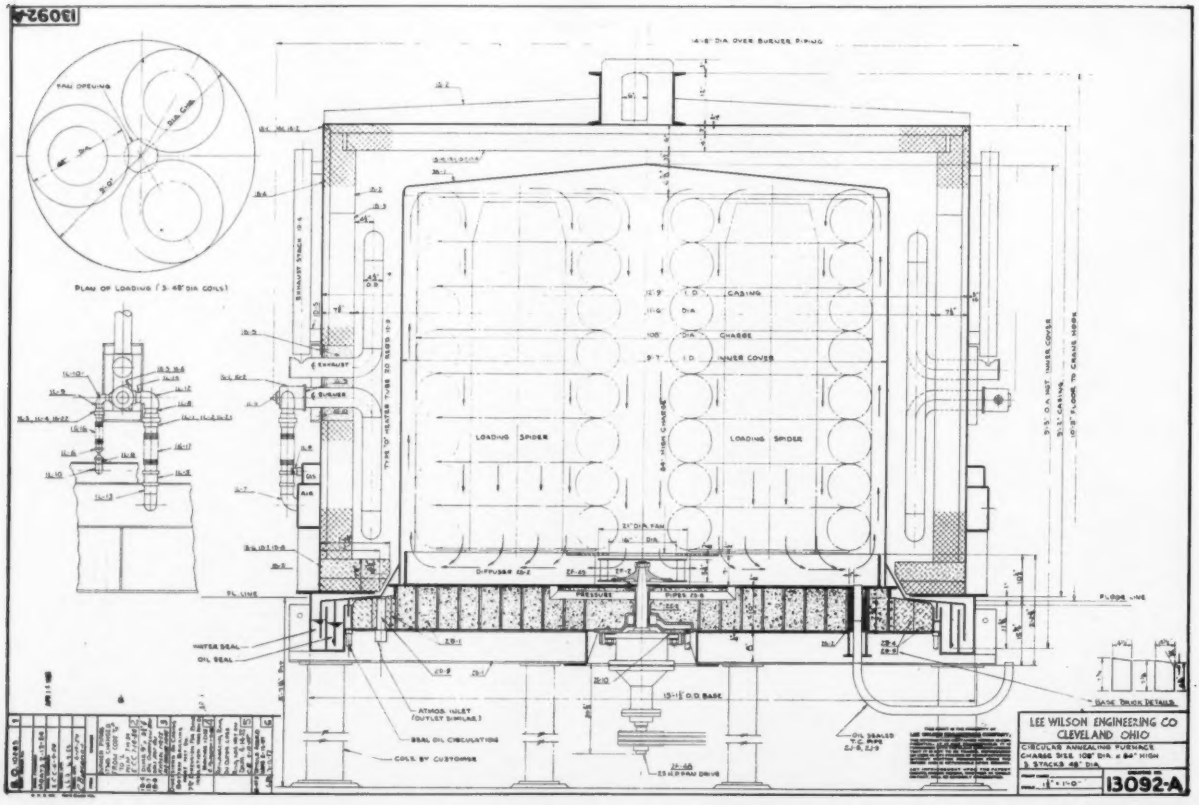

Figure 1.

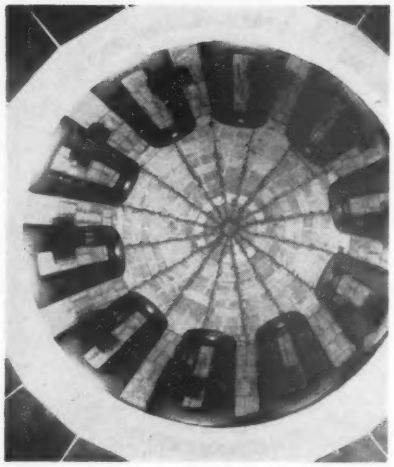

Figure 2.

these vanes, is an alloy casting placed at a very definite angle tangent to the fan clearance circle. The position and angle of the tip are critical because the variation of a few degrees can change the fan delivery by as much as 50%. The diffuser assemblies are made strong enough to carry the load and keep the vanes rigid and are fabricated from either mild steel or alloy in accordance with the type of service and temperatures involved. The fan wheels are made of different high temperature alloys according to the speeds and temperature involved. Satisfactory fan performance has been obtained for operating temperatures as high as 1650 degrees F.

* * *

Figure #4 is a cross-sectional view of the "V" belt type fan drive used to drive the impeller. This particular type of drive has been proven in over 300 annealing bases. In general, the drive provides a top bearing continuously lubricated with filtered oil which flows by gravity from an overhead storage tank. The shaft has an adequate seal on it to prevent any gas leakage, but the area above the seal is entirely pressurized by the indicated pressure pipes so that at maximum temperature, there is a positive pressure above the seal. The fan drive is powered by means of "V" belts driven by motors of the required size which vary from 7.5 h.p. to 25 h.p. depending on the size of furnace involved.

* * *

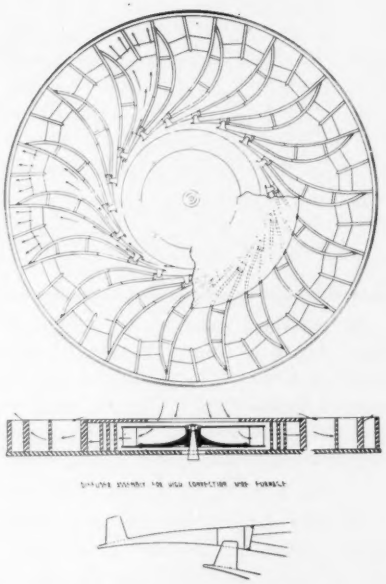

Figure 3.

Referring back to Figure #1, the flow pattern of the gases is a result of a negative pressure area at the center of the fan wheel, a positive pressure area on the discharge side of the fan wheel and

(*Please turn to page* 927)

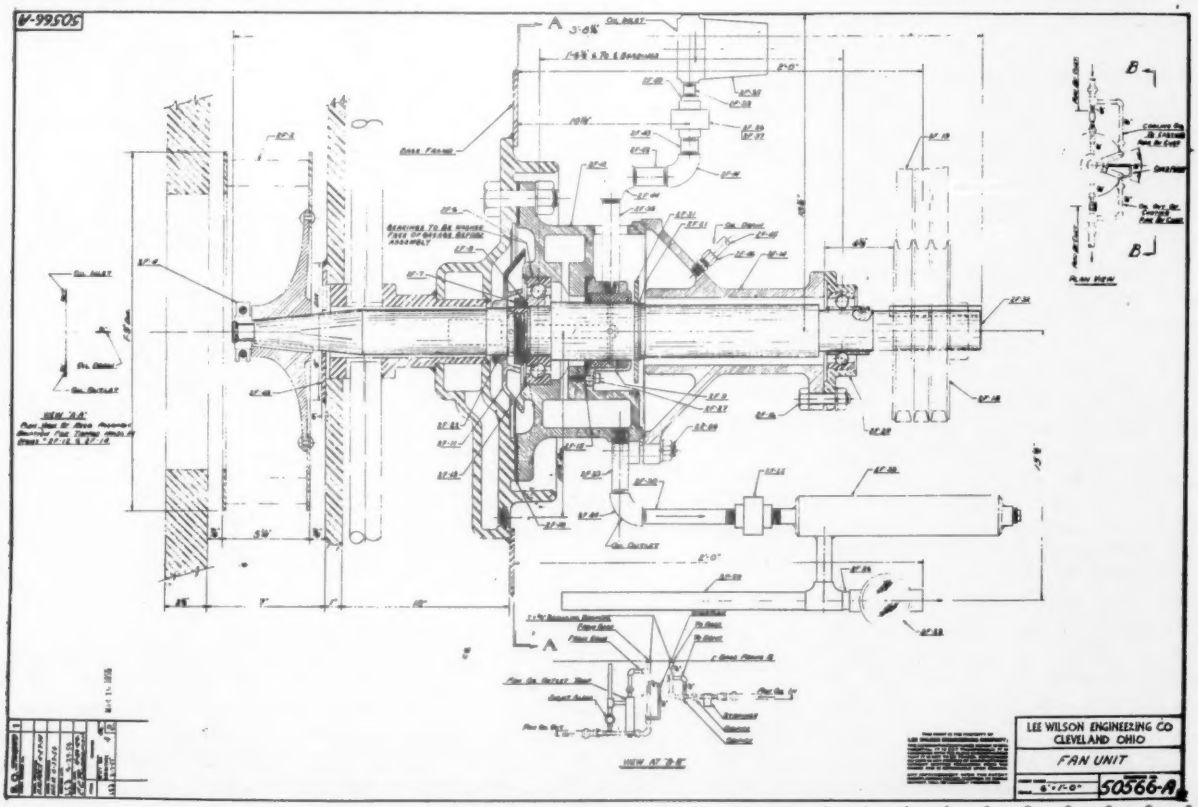

Figure 4.

Welding Machinery

by F. B. Stone, President
Stryco Manufacturing Company
San Francisco, California

This paper was presented as a part of the Panel Discussion on the subject of "New Developments in Wire Machinery" at the Pacific Coast Regional Meeting of The Wire Association in San Francisco, Cal., on June 13, 1957.

It has been well over a half century since **Elihu Thomson** first realized the practicability of fusing metals together by the passage of electric current thru two adjoining sections.

★ ★ ★

It was based on the principle that seems so simple to us now, that any restriction to the passage of current creates heat. The relatively high resistance of steel provide that restriction, therefore it became a natural evolution to develop the basic spot welder which localizes the area of current passage in order to establish a small spot of intense heat. The addition of pressure during this period completes the two necessary steps in making a weld.

★ ★ ★

Thus the old blacksmith process of heat plus hammering becomes mechanized to the point where a job formerly taking minutes is accomplished in a fraction of a second.

★ ★ ★

For several decades spot welding as a manufacturing process lay somewhat dormant. It was a time saver, yes. But it was a new tool and it had to slowly worm its way into established operations which were already getting along nicely with the other methods of fabrication.

★ ★ ★

It was used in a more or less hap-hazard manner with values of heat, time and pressure solely at the mercy of each particular operator. This, of course, created erratic results and condemned its use for any but casual application.

★ ★ ★

It also made itself fair prey to those artisans who stanchly believed such a simple and economical method could never supplant the old tried and true processes. The same people that insisted four wheel brakes would never be practical.

★ ★ ★

As applied to wire I believe one of the first mass migrations of this new process was to the manufacture of lamp shades and kindred articles. This now became a quantity production article instead of an item slowly and laboriously made by hand.

★ ★ ★

Now one more link was forged in our concept of volume production of quality goods for many, instead of a limited number of questionable quality, at a prohibitive price, for the few.

★ ★ ★

From this slow beginning resistance welding became a process around which major manufacturing was developed, instead of being just a means to an end. Engineers began to design around this method of fastening and rapidly found that it resulted not only in immense labor saving, but also in new found lightness, rigidity and strength.

★ ★ ★

From the welding of the component parts of tiny transistors and electronic parts that are barely visible to the naked eye, to the primary fabrication of assemblies for the automotive, aircraft, and building industries resistance welding has come of age.

It must be remembered that at one time wooden buildings were fabricated by the use of pegs, then by hand forged nails. Can you conceive what the development of the automatically produced wire nail did for the lumber industry?

★ ★ ★

We like to think that the resistance welder has done for the wire manufacturer what the nail did for the board.

★ ★ ★

As welding has taken its place as a major and accepted process of manufacturing, builders of control equipment have kept pace with progress. The addition of precision time, pressure, heat and sequencing controls to the basic spot welder has made possible the complete automatic fabrications of articles and assemblies at an unbelievable economy of time and labor.

★ ★ ★

In Detroit and other automotive centers automobile bodies, chassis assemblies and similar articles flow thru automatic welders and emerge structurally and dimensionally precise without being touched by human hands.

★ ★ ★

Aircraft assemblies are fabricated to precise specifications with a strength and safety factor heretofore unbelievable.

★ ★ ★

As welding machines became a part of high speed fabrication the basic spot welder evolved into an unlimited variety of multiple units, forging heads, annealing operations and straight heating units.

Some materials require a preheat, a welding heat and a normalizing heat in rapid sequence, each accompanied by a pressure adjusted to its particular function.

★ ★ ★

We at Stryco have built flash welders which automatically tensile test each weld after it is made, to insure that it will meet the specification written around a particular job.

★ ★ ★

When butt welding wire of a hardenable alloy the weld itself will normally become extremely brittle because of the instantaneous dispersion of the heat into the adjacent metal. We therefore introduce a diminished current following the weld in order to flow the heat back into a section adjacent to the weld. By controlling the value of the current and time we can draw the welded section to approximately the same temper as the original wire.

★ ★ ★

It is not quite true that any weld can equal in all respects the characteristics and structure of the parent metal. In spot welding this can be very closely approached by using a relatively high current and an extremely short, accurate time cycle. Since a greater heat is developed at the faying surfaces of the work than that between work and electrode this short blast of heat will create a fusing temperature before the outer surfaces of the work have been affected. The welded section therefore does not lose its basic structure.

★ ★ ★

In butt welding the objective of ultimate strength is still more sensitive, particularly if the original cross-section must be maintained. We do not have the advantage of the weld being encompassed by undisturbed cold metal as we do in a spot weld. We are also limited in the pressure that can be applied without the collapse of the work.

★ ★ ★

When optimum strength and least disturbance of metallic structure is required we therefore go to a flash weld instead of a resistance pressure weld in which the work is simply a heating element. In a flash weld the heating of the end is accomplished by a multitude of minute flaming explosions as the ends are brought together rather than by the resistance of the work itself. Thus by gauging the speed of the approach of the two ends and precisely timing the current cut-off with the upset action we can accomplish a weld in which the disturbed metal is a wafer which may be only a few thousandths of an inch thick.

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Getting back to spot welding machines in general, of course, the logical means of accomplishing high production is by the use of multiple units. We have built automatic multiple welders which will produce as many as 2500 welds per minute hour after hour.

★ ★ ★

In this type of equipment we immediately become faced with additional problems, one of the most important of which is current consumption.

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Since even high speed welding results in a short blast of current followed by a relatively long period of off time the result is a series of violent impulses of current flow from the source of supply. This is aggravated by the fact that conventional welders operate on single phase current whereas heavy power is generally supplied with three phase. This creates a very undesirable condition from the standpoint of the power company, particularly in areas where the source of power is limited.

★ ★ ★

We have met this condition in several ways, according to the particular issue involved. Where we are concerned with multiple welding we have several alternatives. First we can divide our welding units into three groups and fire them simultaneously from a three phase circuit. We can then subdivide these groups again and again if necessary and fire each section in rapid sequence thus levelling out the impulses until there is almost a continuous flow of current from the supply line.

★ ★ ★

There is still another method of alleviating this heavy surge from a single phase line. Once more the manufacturers of controls have come to the rescue by the development and refinement of conversion units which funnel three phase current into a usable single phase at whatever frequency is best suited to any particular job.

★ ★ ★

Both machine and control can now be matched to the job that is to be done. Wire shelves for stoves and refrigerators, magazine and paper racks, floral designs, toy wagon wheels, super-market wagons, vegetable racks and freezer partitions, bird and animal cages. Welded wire mesh from ½ x ½ x 16 gauge wire to welded wire lathing, to concrete slab reinforcement, to welded cages for concrete pipe, made of rod as heavy as 1½ inches in diameter.

★ ★ ★

All of these flow in a steady stream from automatic and semi-automatic machines that sometimes almost think for themselves.

★ ★ ★

One more important item in the welding machine is the electrode. Starting out as a piece of copper rod, it has become a highly refined alloy tailored to the particular job it has to do.

★ ★ ★

Where once it was expected to refinish or replace an electrode after a few hundred or perhaps a thousand or two welds we can now make as many as a million welds with an electrode costing a dollar or so. Once more it is a combination of properly designed machines and controls that team up to make more and better articles out of wire at less cost to you and me.

What's New in Wire Straightening and Cutting

by F. J. Rybak, Vice President
The Lewis Machine Company
Cleveland, Ohio

This paper was presented as a part of the Panel Discussion on the subject of "New Developments in Wire Machinery" at the Pacific Coast Regional Meeting of The Wire Association in San Francisco, Cal., on June 13, 1957.

This paper will present the types of Wire Straightening and Cutting Machines which are available for various products, with a short discussion of their operation, advantages and limitations, and a brief look into the future.

★ ★ ★

Products from todays machines range from fine filament wire for the precise Electrical Industry to reinforcing rod for the Construction Industry. Straight lengths of Rounds, Squares, Hexagons, Flats and miscellaneous rolled and extruded shapes are produced. Since the War demand has been great for short lengths for Bolts, Pins, Rollers, Shafts as well as standard Welding Rod. With the growth of the Electrical Industry the demand for fine wire products has increased. Titanium rod although new and difficult to handle is being processed on a small scale. Preheating is generally necessary before straightening this material.

★ ★ ★

The industry is demanding high quality and high production. A quality product must be straight, and of uniform length, cross section and internal structure as well as having square cut ends and good surface finish. Most machines available today run at 100 to 200 feet per minute. Fine wire may run considerably slower than this. A few, single purpose, higher production machines have been built for special applications for private use.

★ ★ ★

Two methods of wire and rod straightening are in general use today, both depend on bending the wire beyond the yield point. The Roll Straightener has sets of adjustable Straightening Rolls, generally in two planes, that work the wire as it is fed between the rolls. The other method is the Rotary Straightener type which rotates either the straightener or the stock and imparts bending stresses in an overlapping, helical pattern that achieves a high degree of straightness in round stock. The Roll Straightener is used for straightening shapes such as squares, hexagons etc. and as a pre-straightener for rough straightening of round stock prior to the Rotary Straightener. The Rotary Straightener is used for precision straightening of round stock and to some extent for slightly deformed or "almost round" products such as cable and reinforcing rod. Fine wire is run slower than the larger wire as it requires more flexing or working and on closer centers. For example; several feet of ¼" diameter wire can be bent across one's knee. However, to bend 1/32" diameter wire, one can only bend a few inches with the fingers. The same principle applies in the rotary straightener where a greater RPM is necessary per foot of lineal feed. Rotational speed is limited by safety factor of bearings and material.

★ ★ ★

Many types of cut-off mechanisms have been developed through the years and can be classified as Stationary cut-offs or Traveling cut-offs. The Stationary type stops the wire while the cut is being made and thus limits high speed. A Traveling cut-off such as the Lewis Travel-Cut allows the wire to continue moving. Straightening wire that is stopping and starting in the straightening device is more difficult than straightening under constant flow conditions. Higher quality wire is produced with the Traveling cut-off under all conditions and becomes practically a necessity at high speeds and when running high carbon and alloy wire. The stationary cut-off is used on machines cutting short lengths such as bearing rollers where multiple rise cut-off cams can be used to produce up to 600 pieces per minute.

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Most machines on the market today combine a straightening unit, a cut-off, pinch Rolls for feeding the wire, and a runout table. A number of concerns have placed a draw block ahead of these Standard machines and by welding coils together draw, straighten and cut in one operation. A few of the large Brass mills are using an integral drawing, straightening, cutting and polishing machine. One or two steel mills are experimenting with such units. These machines are limited to long runs of one size because of set up time and must handle only long lengths as straightening is done after cutting. One of the newest installations of combined drawing, straightening and cutting using standard production units is in the automotive field producing steering shafts.

★ ★ ★

So much for the present; let us look to the future which looks very bright as far as higher production machinery is concerned. The application of the Air Clutch and variable speed devices to the machine allows a higher maximum production as well as running a particular wire at its optimum speed. We have just completed the design of a new traveling cut-off and Rotary Straightener that will

(*Please turn to page* 934)

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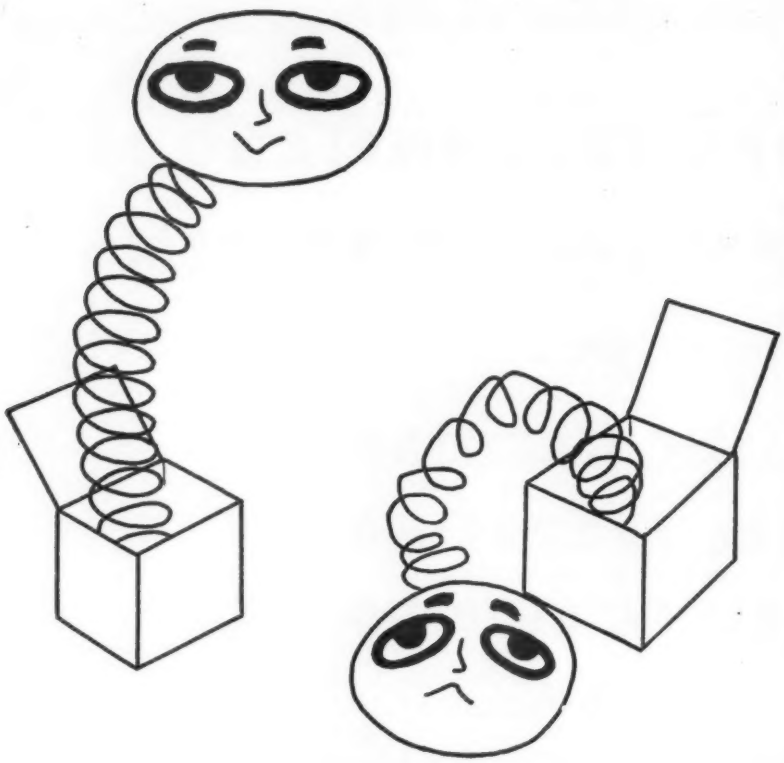

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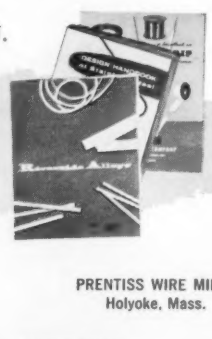

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RIVERSIDE-ALLOY METAL DIVISION

H. K. PORTER COMPANY, INC.

Proceedings

Pacific Coast Regional Meeting of The Wire Association Fairmont Hotel, San Francisco, June 13, 1957

The recorded discussions following the delivery of papers by the panel speakers have been briefed to give the substance of the questions and answers.

Handling, Packaging and Shipping of Wire Products

Lloyd Albright, Pacific Coast Division of the **Colorado Fuel and Iron Corporation,** served as moderator for this session, which resulted in the information that follows.

★ ★ ★

Mr. Merrill was asked whether there was any difference in the PSI of a coil of drawn wire at its beginning and its end where it would be threaded and expressed the opinion that there should be none. The wire in question was used for tying bundles and not in a finished product.

★ ★ ★

Mr. Migge, in answer to a question on the method used for a 600 to 800 pound coil of palletized wire, said that for this package they had a bank of 12 packaging machines in the galvanizing department and the machine placed the wire on the stem. A dead payoff method is used.

★ ★ ★

As to the stems, these, he said, were made outside the plant and were resistance spot welded, no welding rods being used in their manufacture. If not welded properly, they could come apart.

★ ★ ★

Rods and wire are welded together to form large coils prior to subsequent drawing, these butt welds being virtually as strong as any other part of the wire. In drawing a 9/32 rod to 1/40 or 1/38 the welded sections are elongated, which may result in some change in properties that a metallurgist could determine.

(*Please turn to page* 943)

Insulations of the Future

by R. C. Graham, Chief Engineer
Rome Cable Corporation
Rome, New York

This paper was delivered by Mr. Graham at the Spring meeting of the Wire and Cable Section of the National Electrical Manufacturers Association at Rye, N. Y., on April 11, 1957 and is published through the courtesy of NEMA and the author's company.

This is one of the easiest subjects that has ever been assigned to me, and one of the most pleasant mainly because there can be no rebutal—at least for many years to come. So my crystal ball is all polished and ready to go on a little "imagineering".

★ ★ ★

Since this discussion is part of the Power Cable meeting and since we are primarily concerned with the finished product let us slightly revise the subject to "Insulation of the Future—for Power Cables". For obvious reasons I will take the liberty of confining any further remarks to power cables not exceeding the primary distribution voltage range up to 33 KV. We should realize that it is more than probable that some of the so-called cables of the future are already with us today simply waiting for further exploitation. One of these is, of course, polyethylene.

Polyethylene

After a few years of the experimental "trial and error" period following World War II during which polyethylene went through some growing pains familiar to all new material applications a rather remarkable performance record for power cable applications has been established during the last ten years. Over 1,000,000 feet of power cable in the 5 to 15 KV ratings have been installed mainly in the chemical and other similar heavy industrial plants with substantially trouble free performance unequaled by the other more conventional cable types. It is therefore anticipated that other users including utilities will explore possible applications of polyethylene insulated cables for their systems. There are many incentives for this —technical and especially economic.

★ ★ ★

For those of you that are further interested in more specific details a reference to AIEE Conference Paper CP57-279, "Polyethylene for Higher Voltage Cables" presented by this speaker at the 1957 Winter Meeting is suggested. Only because our subject is restricted to insulation must I omit discussion of one of polyethylenes most promising applications—as a cable jacket.

★ ★ ★

Undoubtedly the major criticism of polyethylene for power cable applications involves its high temperature limitations which might be produced by excessive overload. The present conventional material melts at 110°C. Controlled operation below this value has thus far been possible and successful but it would be folly to predict that every future application could be similarly controlled. However, our crystal ball is bright with hope towards a remedy of this situation. Already we have the rapidly approaching availability of the higher density or low pressure polyethylenes that raise the melting point up to a value as high as 135°C, which is in the range of the destructive temperature of many other insulations including paper and oil. Extensions or modifications of this chemistry may well extend this temperature limit. There are, of course, some pitfalls to overcome.

★ ★ ★

The high density polyethylenes that we have seen are extremely tough and stiff—possibly too rigid for most power cable or "heavy wall" applications. This problem is under investigation and some optimism is reported by the introduction of co-polymers or modifiers to improve the inherent flexibility.

★ ★ ★

Another criticism of polyethylene when used in high voltage cables is its lack of arc-resistance which might lead to an errosion type of decomposition. While this problem can be substantially corrected by proper cable design it is gratifying that the same chemical approaches as mentioned for temperature improvement could produce appreciable improvement in this respect.

★ ★ ★

Summarizing, it does not seem too unreasonable to predict that the next five to ten years will see the progressive development of low cost extruded polyethylene-type insulated power cables up to 34 KV with performance characteristics equal to or better than present conventional cable insulation. Note the words, "polyethylene-type". Perhaps the chemist would rather have us use the term "poly-olefins" of which polyethylene is one of a family of materials.

★ ★ ★

Another poly-olefin that we have heard about is a material called polypropolene which might even excite Buck Rogers. From very meager reports it seems that this material is at least electrically as good as polyethylene but greatly

superior in the physical, mechanical, and chemical departments. Some production material is expected within the next two or three years and it should be fairly low in cost. Again, this is reported to be a very stiff material which will need some type of modification to produce an acceptable flexibility. Other poly-olefins such as polybutylene may also enter our picture.

Other Thermoplastic Materials

Teflon

For the last several years some investigators have been predicting a substantial increase in its use as cable insulation. While its high temperature properties are outstanding it is doubtful that such temperature limits are needed in most power cables circuits. There are some technical disadvantages for such application, but this observer believes its inherent high material and fabricating cost will eliminate the serious consideration of Teflon as a future insulation for power cables.

★ ★ ★

Polyvinyl Chlorides

The recent development of the semi-rigid compounds and incorporation of high temperature plasticizers has slightly extended the limiting operating as well as destructive temperature. If some improvement can be realized in electrical properties it is conceivable that certain power cable applications may be successful. It is envisioned that there may be some moderate application up through 5 KV but it is doubtful that PVC insulation will find a power cable field over this value.

★ ★ ★

Nylon

The conventional nylons that we have today are somewhat stiff, expensive and difficult to process for power cable insulation. Moreover, the nylons lack moisture resistance. It is doubtful that this material will occupy an important role in the future of power cables.

Mylar

This high strength material is the film counter part of the popular fabric "Dacron" and possesses similar features. Its thermal and electrical properties are attractive and it is moderately low in cost. So far, this thermoplastic does not lend itself to extrusion, but when used as a thin tape, it may find useful places as a component of power cable or even as a synthetic replacement of paper or varnished cambric tapes.

Elastomeric or Rubber Insulations

Butyl

Nobody can deny that this synthetic rubber has found a most useful application as power cable insulation during the last ten years and the future will certainly continue its increasing popularity. While there are no new synthetic rubber polymers on the horizon that might replace butyl, there are some developments underway that should desirably improve its uniformity and processing such as "brominated" butyl and new accelerators that are hoped to increase the rate of cure for this relatively slow curing material. New fillers and reinforcing agents will be forthcoming which will mean improved mechanical properties. Along this line I believe we will see an increasing use of butyl for cable jacketing compounds. It is also expected that specifications for butyl power cable insulation will be revised to be more realistic and representative of its properties. It is important that any specifications should be based insofar as possible on actual operation or service needs.

★ ★ ★

Silicone Rubber

This material is a good future bet as insulation on power cables for special applications. Principal criticism thus far has been its lack of mechanical toughness, processing difficulties and its relatively high cost. However, new silicone rubbers have recently been developed that exhibit tensile strength values up to 2000 lbs. per square inch, new compounding techniques are being explored which will reduce the processing problem, and with increased use the cost of material should come down appreciably. Here then is a rubber compound which could "out-butyl" butyl as insulation with equal or better moisture resistance, equal or better toughness, better electrical properties, better solvent resistance, better resistance to heat and cold and better ozone resistance. Higher operating as well as overload temperature ratings can also be realized if needed.

★ ★ ★

Hypalon

The chemical name for this new ozone-proof synthetic rubber is chloro-sulfenated polyethylene. It looks, acts, and handles somewhat like Neoprene — yet unlike Neoprene it has moderately good electrical properties and is an improvement in most other physical respects except on oil resistance. It would appear that this material may have some prospects as a combined insulation and sheath for certain low voltage (600 volts) power cable applications and its long-range cost picture could be attractive.

General

In any consideration of the future we must not overlook **irradiation,** which consists of exposing the material to be treated to high voltage, high velocity electron bombardment, such as gamma-rays or X-Rays. Dependent upon the "dosage" an internal chemical cross linking of the material takes place. This results in a change of properties. Some materials such as polyethylene are improved thermally and other materials may either be up-graded or degraded in various respects. There is much to be learned in this new science, such as knowledge about sensitizers or accelerators to reduce the dosage. In any event, the equipment and operation needed to perform the job is very costly and would represent a major ex-

(*Please turn to page* 921)

Expansion and Modernization Program of Roebling's Electrical Wire Division Well Advanced

A multi-million dollar expansion and modernization program that has been under way for the past two years is rapidly nearing completion.

* * *

This has involved the razing of some old structures and the building of new, all with the thought of increasing the efficiency of manufacturing operations and broadening the scope of the types of cables produced at the company's Buckthorn Plant in Trenton. Rod rolling and wire drawing will be continued at Roebling, N. J., as heretofore, the Buckthorn operations being confined to insulation.

* * *

The program is a part of the larger, overall diversification plans of the parent company, the **Colorado Fuel and Iron Corporation,** of which the **John A. Roebling's Sons Corporation** is a wholly-owned subsidiary.

* * *

At this plant there has already been completed an extensive new laboratory for testing and research for the specific use of the Electrical Wire Division. This includes equipment for cyclic and corona testing.

* * *

Other equipment installed embraces two new Robertson continuous lead presses, a new Syncro 64 head paper taping machine for high voltage cable, new Davis-Standard rubber and plastic extruding machines, a modernized 3-roll calendar and a new vertical continuous vulcanizing machine.

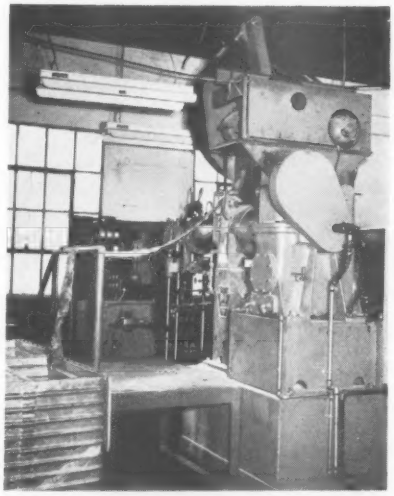


Fig. 1—View of two of three pay-off stands of the Davis-Standard vertical continuous vulcanizer on the lower floor. * * * * * * * * * * *

The Vertical Continuous Vulcanizer

This last machine is unique in many ways and is worthy of special note in that it departs from the conventional horizontal CV method of curing rubber coatings. It was conceived by Roebling engineers and built especially for them by the **Davis-Standard, Division of Franklin Research Corp.** for use on a variety of high voltage cables.

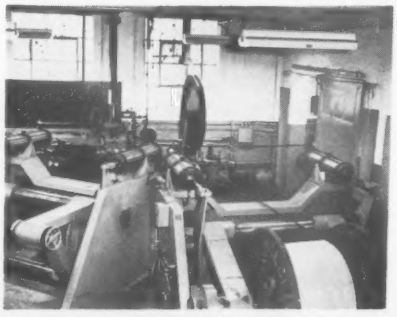


Fig. 2—View on upper floor showing the D-S extruder, from which butyl covered wire goes downward through the vertical vulcanizer. * *

* * *

The problems inherent in extruding and vulcanizing butyl insulations were principally responsible for its development. Butyl rubber, in its unvulcanized state, is soft and putty-like and highly vulnerable to abrasion and flattening in a horizontal vulcanizer, especially for the larger conductor sizes of 250,000 CM up to and including 1,500,000 CM with 15 KV ungrounded walls of insulation.

* * *

The machine operates in two stories of the building. On the lower floor are three supply payoffs arranged in an arc. From these the cable to be insulated can be joined together, so there is no break in the continuity of the cable. The machine operates 24 hours per day at speeds that may be varied from one to twenty-five feet per minute. The cable to be covered travels upward through a tube into the extruder above, from which the butyl rubber covered cable travels vertically downward through a vulcanizing tube, emerging at the bottom, cooled and hard, with no deformations whatsoever.

* * *

Provision is made for concentricity control and the cable insulated in this manner has been found to have excellent physical properties. This uniformity of concentricity and diameter vastly improves dielectric strength and helps to maintain an even corona level.

(*Please turn to page* 923)

New England Bar Mill Opened by J & L

Officials of some 250 New England business firms, as well as local civic and industrial leaders, were guests of the **Jones & Laughlin Steel Corporation** on June 12th at an open house at the company's new cold finished bar mill in Willimantic, Connecticut.

★ ★ ★

The visitors made a brief tour of the new facilities and were served a buffet luncheon. **John E. Timberlake,** Vice President of Sales and Director, and **David T. Rogers,** Manager of the Cold Finished Bar Division, were present from the Pittsburgh headquarters of J&L.

★ ★ ★

H. H. Meyer, Manager of J&L's new Willimantic Division, said in welcoming the visitors that the new plant is designed to produce quality cold finished steels within easy reach of the large and growing New England markets for these products. Jones & Laughlin has been active in Eastern markets for cold finished steels for many years; prior to the completion of the Willimantic plant, however, shipments of cold finished bars were made from J&L's Pittsburgh Works.

★ ★ ★

The new mill will employ about 70 persons in its initial stages of production.

★ ★ ★

Hot rolled bars, the raw materials for the Willimantic plant, are rolled at J&L mills in Pittsburgh and shipped here for cold drawing and processing into cold finished products.

Cold finished bars are widely used in the machine tool and screw machine industries, where the bars are fashioned into the moving parts of machines like those used by textile and shoe manufacturers, and in any applications where close tolerance or high finish are required. J&L, pioneer producer and one of the nation's largest manufacturers of cold finished bars, also has cold finishing facilities at Pittsburgh, Pa., and Hammond, Ind.

John E. Timberlake, Vice-Pres.

Schumag continuous cold drawing machines are used in the Willimantic manufacturing process. Coils of hot rolled steel are fed into the machines, which draw, straighten, polish, and cut to length in one continuous operation. J&L is one of the first American steel companies to use the new machines.

★ ★ ★

Other equipment includes a cleaning house, Medart and Sutton straightening and cutting machines, Aetna Standard draw benches, a Magnetic Analysis flaw detection unit, a Reliance speed control device and very complete laboratory and testing equipment. The entire plant is equipped with an overhead material handling system.

★ ★ ★

The new plant is situated on a 31-acre site on Connecticut Route 32, just north of Willimantic. The property runs from Route 32 west to the Willimantic River, straddling the Central Vermont Railroad.

★ ★ ★

The one-story, L-shaped building is 535 feet long and 250 feet wide at the widest point of the "L." It contains approximately 90,000 square feet of production and office space.

(*Please turn to page* 931)

THE ANNUAL CONVENTION OF THE WIRE ASSOCIATION

LA SALLE HOTEL, CHICAGO, ILLINOIS, MONDAY THROUGH THURSDAY OCTOBER 14-17, 1957

The Wire Association's Headquarters at The La Salle Hotel
Will be open each evening from Sunday, October 13th, except Wednesday night.
YOU ARE CORDIALLY INVITED TO CALL AND MEET OTHER WIRE INDUSTRY MEN

THERE WILL BE A REGISTRATION FEE OF $11.00 FOR MEMBERS AND $13.00 FOR NON-MEMBERS, INCLUDING AN ANNUAL LUNCHEON TICKET, FOR ALL THOSE ATTENDING THE TECHNICAL SESSIONS AND MEETINGS. PLEASE HAVE YOUR ASSOCIATION MEMBERSHIP CARD WITH YOU AND SHOW IT WHEN REGISTERING.

ADMISSION WILL BE BY BADGE ONLY—PLEASE WEAR IT.

THE WIRE ASSOCIATION PROGRAM COMMITTEE FOR THE 1957 CONVENTION

GENERAL PROGRAM CHAIRMAN
John L. Sanderson
Superintendent, Wire Mills
Keystone Steel & Wire Company
Peoria, Illinois

GENERAL ACTIVITIES

EXECUTIVE SECRETARY
Richard E. Brown
The Wire Association
Stamford, Conn.

REGISTRATION
R. S. Spengel, Asst. Exec. Secy.
The Wire Association
Stamford, Conn.

ENTERTAINMENT
Eber J. Hubbard, Pres.
Hubbard Spool Co.
Garrett, Ind.

All papers presented at the Convention by members of The Wire Association are eligible for consideration for the Annual Medal Award, and will be voted upon by the Board of Directors at the Next Spring meeting of that body.

FERROUS DIVISION

CHAIRMAN

John H. Corson, Mgr. of The Laboratory
Carpenter Steel Co., Reading, Pa.

COMMITTEE MEMBERS

William R. Cook, Asst. Supt., Wire Mill
Union Wire Rope Corp.
Kansas City, Mo.

Carleton W. Garrett, Metallurgical Eng.
Jones & Laughlin Steel Corp.,
Aliquippa, Pa.

William H. Louder, Supt., Wire Mills
Bethlehem Steel Corp.
Williamsport, Pa.

Gordon T. Spare, Project Eng.
American Steel & Wire Div.
United States Steel Corp.
Cleveland, Ohio

Technical papers are preprinted in the October issue of Wire and Wire Products insofar as possible. Titles to papers accepted will be given to The Wire Association and duly copyrighted at the time of publication.

NON-FERROUS DIVISION

CHAIRMAN

E. D. Bent, Chief Engineer
Wire and Cable Division
Northern Electric Co., Lachine, P.Q., Can.

COMMITTEE MEMBERS

Samuel C. Avallone, Dir. Met.
Electric Cable Works,
American Steel & Wire Div.,
U. S. Steel Corp., Worcester, Mass.

Richard E. Hutchinson, Supt.
Wire Drawing, Kaiser Aluminum
and Chemical Corp., Newark, Ohio

Alexander E. Kerr, Supt. Prod.,
Electrical Wire Div.
John A. Roebling's Sons Corp.
Trenton, N. J.

J. F. Stoltz, Eng., Ironwork and
Clearing Prod., Hawthorne Works,
Western Electric Co., Chicago, Ill.

All wire mill men and wire mill suppliers are invited to attend this convention, see how the Association functions and participate in the activities. Simultaneous technical sessions for Ferrous and Non-Ferrous Divisions are held.

REGISTRATION AND TECHNICAL MEETING ROOMS ARE ON THE MEZZANINE. Please be prompt in your arrival for the technical sessions. Those with rooms for entertainment are requested NOT TO KEEP THEM OPEN during the technical sessions.

MONDAY, OCTOBER 14th

9:00 A.M.
REGISTRATION

10:00 A.M.
DIRECTORS' MEETING

12:30 P.M.
PROGRAM COMMITTEE LUNCHEON

THE CONVENTION PROGRAM

LA SALLE HOTEL, CHICAGO, ILLINOIS, OCTOBER 14-17, 1957

MONDAY MORNING—

9:00 A.M. Registration Desk opens on the Mezzanine Floor.

10:00 A.M. Annual Meeting of the Board of Directors of The Wire Association.

12:30 P.M. Directors' Luncheon for Program Participants. Address of Welcome by Tom M. Girdler, Jr., President, The Wire Association.

FERROUS DIVISION TECHNICAL SESSIONS

MONDAY AFTERNOON—2:00 P. M.

CHAIRMAN OF MEETING

John M. Corson, Manager of The Laboratory
The Carpenter Steel Co., Reading, Pa.

SYMPOSIUM ON WIRE PLATING

PAPER: "Plating Wire Products for Eye Appeal—Survey of Finishes and Processes"	by R. T. Gore, Market Development Eng. Metal and Thermit Corp., Rahway, N. J.
PAPER: "The Plating of Wire for Eye Appeal"	by O. B. Lusk, Chief Inspector, United Steel & Wire Co., Battle Creek, Mich.
PAPER: "Plating From the Consumers Standpoint"	by L. L. Richards, Project Engineer Philco Corporation, Philadelphia, Pa.
PAPER: "Progress in Vertical Storage"	by A. F. Anjeskey, Sales Mgr., Cleveland Tramrail Div. Cleveland Crane & Engineering Co. Wickliffe, Ohio

TUESDAY MORNING—9:30 A.M.

CHAIRMAN OF MEETING

William R. Cook, Assistant Superintendent, Wire Mill
Union Wire Rope Corp., Kansas City, Mo.

PAPER: "Combined Hot Rolling and Patenting of Rod"	by Dartrey Lewis, Chief Eng., Res. & Devel. John A. Roebling's Sons Corp., Trenton, N. J.
PAPER: "A Simple Method of Carbon Restoration"	by John Arnold, Chief Engineer Lee Wilson Engineering Co., Cleveland, Ohio
PAPER: "Comparison of Gas and Electric Strand Annealing Furnaces"	by Harold Notarius, Mechanical Engineer The Wilbur B. Driver Co., Newark, N. J.
PAPER: "Furnaces for the Heat Treatment of Wire"	by John P. Zur, Metallurgical Eng., Industrial Furnace Div. Sunbeam Corp., Chicago, Ill.
PAPER: "Continuous Electric Direct Resistance Method for Heat Treating of Steel Wire"	by Oscar C. Trautman, President Trauwood Engineering Co., Cleveland, Ohio

TUESDAY AFTERNOON—2:00 P.M.

CHAIRMAN OF MEETING

Gordon T. Spare, Project Engineer, American Steel & Wire Div.
United States Steel Corp., Cleveland, Ohio

PAPER: "Disposable Packaging"	by Fred J. Bieber, President Acrometal Products, Inc., Minneapolis, Minn.
PAPER: "Wire Packaging System"	by E. Jefferson Crum, Technical Consultant Riderwood, Md.
PAPER: "Recent Developments in Steel Wire Drawing Machinery"	by James E. Spearman, Asst. to the President and Maurice A. Nye, Chief Eng. The Vaughn Machinery Co., Cuyahoga Falls, Ohio
PAPER: "A Weldable 12.00% Chromium Stainless Steel"	by W. R. Kegerise, Metallurgist-Development The Carpenter Steel Co., Reading, Pa.

WEDNESDAY MORNING—9:30 A.M.

CHAIRMAN OF MEETING

Carleton W. Garrett, Metallurgical Eng., Product Development Div.
Jones & Laughlin Steel Corp., Aliquippa, Pa.

PAPER: "Appropriate Rods for Appropriate Wire"	by Ivan P. De Witte, C.E., Mgr. of Res. & Control Trefileries Leon Bekaert, Zwevegem, Belgium
PAPER: "Mechanical Blast Cleaning of Wire Rod"	by Kenneth J. Sorace, Chief Project Eng. Lamson & Sessions Co., Cleveland, Ohio and Gilbert D. Dill, Sales Eng., Chg. Steel Div. Wheelabrator Corp., Mishawaka, Ind.
PAPER: "Problems Encountered in Cold Heading Stainless Steels"	by S. E. Tyson, Metallurgist-Stainless Steels The Carpenter Steel Co., Reading, Pa.
MOTION PICTURE: "The Long Pull"	Shown through the courtesy of the Bethlehem Steel Company, Bethlehem, Pa.

THE CONVENTION PROGRAM

LA SALLE HOTEL, CHICAGO, ILL., OCTOBER 14-17, 1957

NON-FERROUS DIVISION TECHNICAL SESSIONS

MONDAY AFTERNOON

CHAIRMAN OF MEETING

R. E. Hutchinson, Assistant Production Superintendent,
Kaiser Aluminum & Chemical Corp., Newark, Ohio.

PAPER: "Production Control—Functions and Organization"	by James D. Donovan, Asst. Production Superintendent, Kaiser Aluminum & Chemical Corp., Newark, Ohio.
PAPER: "Aluminum for Fastener Production"	by O. L. Burtenshaw, Senior Metallurgist, Kaiser Aluminum & Chemical Corp., Newark, Ohio.
PAPER: "Oxide Coatings on Aluminum Wire"	by A. A. Defoe, Chief Engineer, Electrical Conductor Engineering Dept., Aluminium Laboratories Limited, Kingston, Ont., Canada

TUESDAY MORNING

CHAIRMAN OF MEETING

J. F. Stoltz, Engineer, Rod and Wire Manufacture, Western Electric Co., Chicago, Ill.

PAPER: "Continuous Vulcanization of High Voltage Butyl Insulated Cable"	by A. L. Rosener, Process Development Engineer, John A. Roebling's Sons Corp., Trenton, New Jersey.
PAPER: "Extrusion Coatings"	by Don Craft, E. I. du Pont de Nemours & Co., Wilmington, Delaware.
PAPER: "A Method of Controlling the Contour of Tungsten Carbide Dies Used in Drawing Copper Wire"	by W. R. Moyers and G. M. McLeod, Western Electric Company, Inc., Tonawanda Plant, Buffalo, New York.

TUESDAY AFTERNOON

CHAIRMAN OF MEETING

A. A. Kerr, Superintendent of Production,
John A. Roebling's Sons Corporation, Trenton, New Jersey.

PAPER: "Weighing Samples of Wire to Determine Accurately the Hole Size of Fine Gage Diamond Dies"	by W. R. Moyers and G. M. McLeod, Western Electric Company, Inc., Tonawanda Plant, Buffalo, New York.
PAPER: "Standardization of Torque Values for Stiffness Testing of Wires Used as Radio Grid Siderods"	by J. R. Howell, Engineer in Charge, Engineering Services, Sylvania Electric Products Inc., Warren, Pennsylvania.
PAPER: "Buried Distribution of Telephone Circuits"	by C. C. Lawson, Plant Construction Eng., Bell Telephone Laboratories, Inc., Murray Hill, New Jersey.
FILM: "Cable Makers"	Shown through the courtesy of Rome Cable Corp., Rome, New York

WEDNESDAY MORNING

CHAIRMAN OF MEETING

S. C. Avallone, Electric Cable Works, American Steel & Wire Div.,
U. S. Steel Corporation, Worcester, Mass.

PAPER: "Weaving Aluminum Insect Screening"	by Robert E. Hirt, Supt. Wire Drawing Mill, Hanover Wire Cloth Div., Continental Copper & Steel Industries, Inc., Hanover, Pa.

THURSDAY MORNING

PLANT INSPECTION TRIPS

NON-FERROUS DIVISION TOUR—Plant Inspection Trip to Revere Copper & Brass.

WEDNESDAY PROGRAM (Cont'd.)

AT 1:00 P.M.—THE ANNUAL WIRE ASSOCIATION LUNCHEON

(Century Room, 19th Floor)

LADIES ARE WELCOME LADIES ARE WELCOME

THE PRESENTATION OF AWARDS FOR 1956 PAPERS

MEDAL AWARD: To George A. Sweitzer, Jr., Metallurgical Investigator, Jones & Laughlin Steel Corp., Aliquippa, Pa., for his paper: "Electromatic Oil Tempered Wire."

CERTIFICATE OF HONORABLE MENTION (FERROUS DIV.): To N. Dale Montgomery, Metallurgist, Rod and Wire Div., Pittsburgh Steel Company, Monessen, Pa., for his paper: "Control Measures for the Heat Treatment of High Carbon Rods and Wire."

CERTIFICATE OF HONORABLE MENTION (NON-FERROUS DIV.): To John D. Sprowl, Department of Metallurgical Research, Kaiser Aluminum & Chemical Corp., Spokane, Wash., for his paper: "Hot Dip Wire Aluminizing Processes and Alloys."

PRESENTATION OF TWENTY-FIVE YEAR CERTIFICATES by Leslie C. Whitney, Chairman, Board of Past Presidents.

THE MORDICA MEMORIAL LECTURE: "About The Wire Association" by Richard E. Brown, Executive Secretary, The Wire Association, Stamford, Conn.

AT 4:00 P.M.—THE ANNUAL MEETING OF THE WIRE ASSOCIATION

This is the annual business meeting of members of the Association. Your personal attendance is needed and urged to discuss proposals and transact business.

Chairman of Meeting
Tom M. Girdler, Jr., President
The Wire Association

IN THE EVENING BALLROOM, 19TH FLOOR

THE ANNUAL STAG SMOKER—DINNER

6:30 P.M.—Cocktail Bar Opens

7:30 P.M.—Dinner and Show

CHAIRMAN, ENTERTAINMENT COMMITTEE: Eber J. Hubbard, Jr.

COME ONE, COME ALL—ENJOY FELLOWSHIP AND A GOOD SHOW!

THURSDAY MORNING

PLANT INSPECTION TRIPS

FERROUS DIVISION TOUR—Busses will leave the hotel at 9:00 for the tour of the Joliet Works of the American Steel and Wire Division of the U. S. Steel Corp. at Joliet, Ill. Luncheon will be served there through the courtesy of the division.

NON-FERROUS DIVISION TOUR—Busses will leave the hotel at 9:30 for the tour of Revere Copper & Brass mill.

ALL MEN IN ATTENDANCE ARE INVITED TO GO ON ONE OR THE OTHER OF THESE TOURS. BE SURE TO BUY YOUR BUS TICKET IN ADVANCE.

FOR THESE TOURS, ALL PERSONS MUST GO BY BUS. NO PRIVATE CARS MAY BE USED. TO BE ADMITTED, EACH VISITOR MUST WEAR HIS BADGE; NO EXCEPTIONS PLEASE. THESE MEASURES ARE FOR SECURITY, SAFETY AND THE IDENTIFICATION OF VISITORS.

These plant inspection trips conclude the 1957 Convention.

RESEARCH PAPERS ARE PREPRINTED IN THE OCTOBER ISSSUE OF WIRE AND WIRE PRODUCTS.

A summary of the discussions and the Mordica Memorial Lecture will appear in the January issue of Wire and Wire Products.

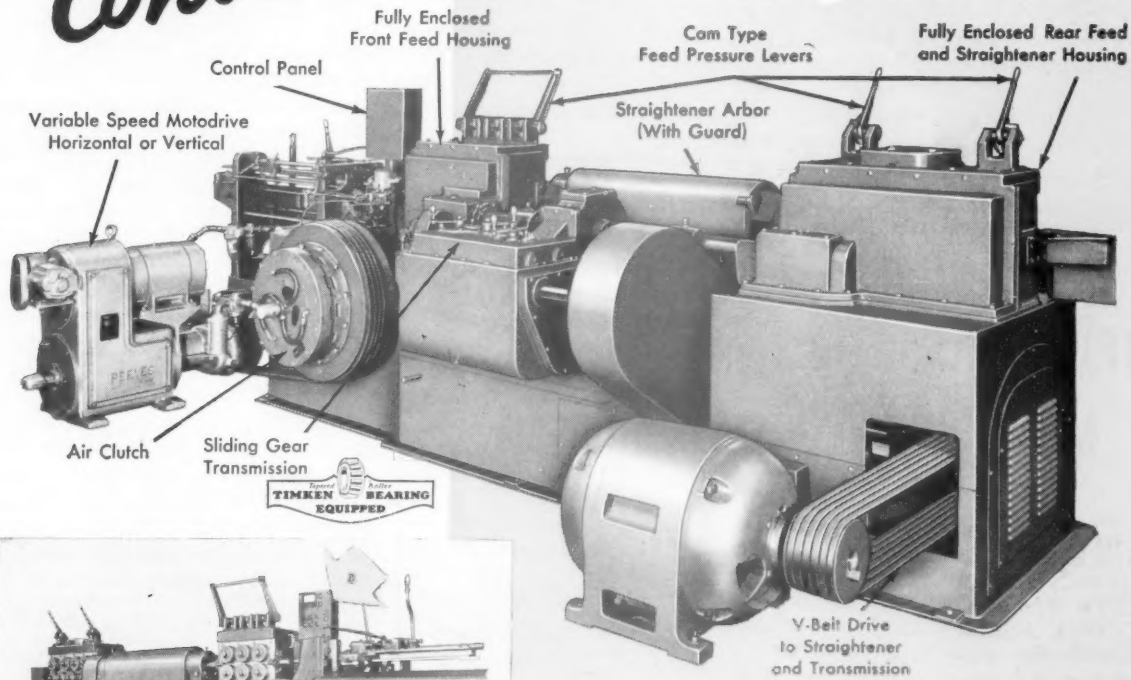
Papers not received in time for preprinting will be published in the November and December issues of Wire and Wire Products.

SCHEDULING OF PAPERS SUBJECT TO CHANGE IN FINAL PROGRAM

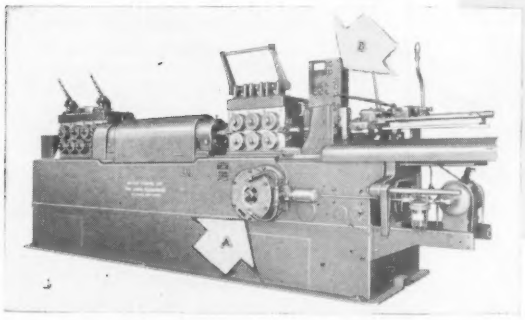
Better Quality Control

LEWIS

introduces the Air Clutch on wire straightening and cutting machines



No. 11-F Travel-Cut with Flying-Shear Cut-off. Capacity ½" to ¾" diameter. 75-135 feet per minute. Rear view (above) with guards removed showing air clutch and drive.



Front view of No. 11-F Travel-Cut with Flying Shear Cut-off showing Air Brake "A" (with guard removed) and operating panel "B" with push-button controls for Air Clutch, Reeves Motodrive and flywheel speed Indicator Tachometer.

● Lewis engineers have added three important improvements to their famous Travel-Cut Machines for BETTER QUALITY CONTROL . . . These machines are already in service in America's leading steel and wire mills.

Wichita Air Clutch permits higher cut-off speeds, eliminates shock of conventional clutch. No adjustment necessary . . . automatically compensates for wear.

Wichita Air Brake eliminates conventional mechanical drag brake and is only engaged for a short portion of the cut-off cycle.

Reeves Variable Speed Motodrive permits infinite adjustment of flywheel speed for perfect synchronization of the cut-off and wire feed speeds. This unique arrangement makes possible the cutting of rod WITHOUT SPOT SWELL . . . allows finer adjustment for cutting short lengths. Dial tachometer registers flywheel speed.

There are Standard Lewis Travel-Cut or Stationary-Cut Machines designed to straighten and cut all materials and shapes in wire or rod from .012" to ¾" at a wide range of feed speeds.

Air Clutch available on all Travel-Cut Models. Send for new brochure showing complete line of Lewis Wire Straightening and Cutting Machines.

LEWIS MACHINE COMPANY 3440 East 76th Street Cleveland 27, Ohio

Quality Control Conference

The New England sections of the American Society for Quality Control announces its Eleventh Annual Conference. This year the conference will be held at the Stratfield Hotel, Bridgeport, Conn., on October 16, 17, and 18, 1957.

* * *

The conference is designed to make available information on the latest developments and ideas, to help industry of all types to improve product quality at lower operating costs.

The Program Committee is including clinic speakers who will present phases of Quality Control activities that relate to Aircraft, Jet Power, Missiles, Nucleonics, Ultrasonics and a practical approach to Human Relations. These features, plus an Educational, Management and other seminars, will make a well-rounded program.

* * *

A program copy with complete information can be obtained by mailing your request to P. O. Box 68, Greendale Station, Worcester, Mass.

MODEL "J" TYPE AUTOMATIC

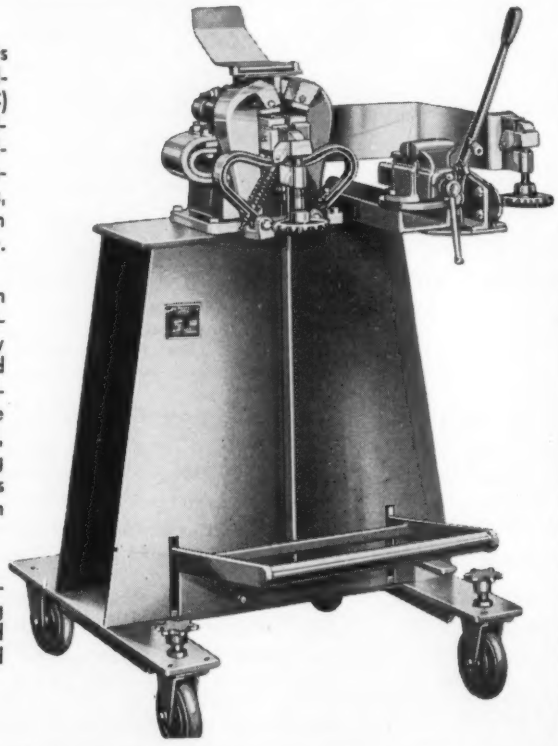
MICROMETER PRECISION — MICRO-WELD — TRADE MARK REGISTERED

MICRO-WELD BUTT WELDER

This type welder is available in four Models (J-45-C) (J-5-C) (J-7-C)(J-8-C) for welding COPPER, ALUMINUM, and other nonferrous wire and rods, ranging in size from .080" to ½" diameter.

The welding cycle on these units is automatically completed by one single downward stroke of the foot pedal, which clamps the stock being welded, contacts the welding switch, and supplies the upset pressure on the weld.

All welders are equipped with annealing dies, filing vise, hand shears, and mounted on a 4-wheel truck.



MICRO PRODUCTS COMPANY

20 NORTH WACKER DRIVE, CHICAGO 6, ILL.

Telephone, State 2-7468

Electrolytic Degreasing of Metallic Surfaces

From Draht-Welt, March 25, 1957

In order to hold the cost of degreasing as low as possible, the modern electrolytic degreasing baths are effective, simple in operation and profitable. In electrolytic degreasing baths one must distinguish between those containing cyanide and those that are cyanide-free. Through the solution of a single salt combination degreasing bath "normal" in water, a cyanide electrolytic degreasing bath results, which works quickly and thoroughly. Steel, copper, brass, zinc, zinc injection die-castings, aluminum, aluminum and magnesium alloys are electrolytically degreased in about one minute. A further electrolytic degreasing bath, also cyanide, with the same properties as the foregoing, leads simultaneously to a light copper plating after the conclusion of the degreasing. With the exception of light metals and stainless steel, all metals can be thus electrolytically degreased.

* * *

A cyanide-free bath serves for cathodic and anodic degreasing of iron and steel parts as well as copper and brass (up to alloy Ms 63). The cyanide-free bath "Unar" EL 58 is somewhat milder, serves exclusively for the cathodic degreasing of sensitive metals, for degreasing zinc and zinc alloys and copper and brass (up to the alloy Ms 58). Moreover, it does not attack highly bright polished metallic surfaces.

NEMA Announces New Members

Nine electrical manufacturing companies have become members of the **National Electrical Manufacturers Association,** it is announced by **Joseph F. Miller,** the Association's Managing Director.

* * *

Each has affiliated with a dif-

ferent NEMA subdivision, with one becoming a member of four. The Association is composed of 82 product groupings. Member companies affiliate only with those subdivisions whose scopes cover the products they manufacture.

★ ★ ★

The new member companies, together with their voting representatives in the Association, and the subdivisions with which they have affiliated, follow:

Continental Gin Company, Birmingham, Ala., George C. Morgan, Vice President, Industrial Division — Mining Belt Conveyor Section.

Joslyn Manufacturing and Supply Company, Chicago, Ill., E. H. Yonkers, Vice President — Lightning Protective Devices, Street Lighting and Switchgear Sections, as well as the High Voltage Fuse Group of the Switchgear Section.

Electric Distribution Products, Inc., Allentown, Pa., E. T. Carlson, Vice President and General Manager—Low Voltage Distribution Equipment Division and Busway Section.

Continental Wire Corporation, Wallingford, Conn., E. Q. Harrigan, President—Wire and Cable Section.

Edco International Corporation, Detroit, Mich., A. V. Cauhorn, President—Wiring Device Section.

Utility Transformer and Equipment Company, Baraboo, Wis., G. G. Gordon, Vice President—Specialty Transformer and Transformer Sections.

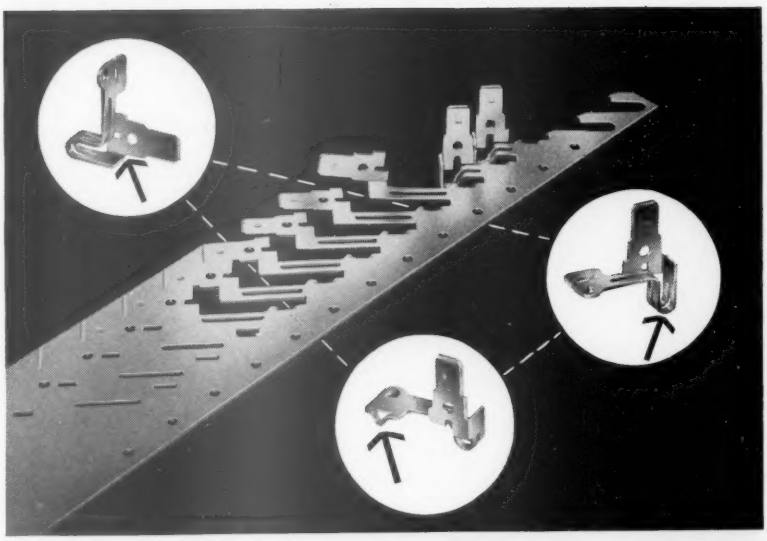
Twentieth Central Manufacturing Company, Minneapolis, Minn., Clark S. Peterson, partner—Arc Welding Section.

Franklin Electric Company, Inc., Bluffton, Ind., E. J. Schaefer, President —Motor and Generator Section.

Paramount Industries, Inc., Flint, Mich., B. R. Bailey, General Manager—Industrial and Commercial Lighting Equipment Section.

Wire Rope Recommendations

A new bulletin, Wire Rope Recommendations for General Contractors, has been prepared by the **American Cable Div., American Chain & Cable Co., Inc.,** Wilkes-Barre, Pa. Describing the manufacturer's complete line of Tru-Lay Preformed Wire Rope, Wire Rope Accessories and Dualoc Boom Cable Assemblies, this 16-page bulletin designated DH-128-B, contains data on construction features, applications, diameters, etc., all of interest to engineers and contractors. American Cable supplies the construction industry with many grades and over 100 constructions of wire rope.



Cut costs on tough forming jobs with Elephant Brand®
fine grain **phosphor bronze**

Automatic metal-forming machines operate best when they are fed materials of uniform, dependable quality. To shape critical details like those shown on these switch parts, many manufacturers rely on Seymour ELEPHANT BRAND phosphor bronze. Its fine grain permits making sharp bends, severe draws and other complex forming operations with a minimum of rejections or tooling adjustments.

Seymour ELEPHANT BRAND combines in one fine grain phosphor bronze alloy; high ductility, great strength, uniform temper, long fatigue life, and fine finish. These qualities prompt discerning users to say:—"Specify Seymour ELEPHANT BRAND . . . there's no finer phosphor bronze!"

ALL ELEPHANT BRAND phosphor bronze is fine grain

The first phosphor bronze produced in the U.S. was ELEPHANT BRAND. Made by a carefully guarded process which insures the highest degree of purity and uniformity, it has a grain structure of very fine, uniform crystals free from segregation, coring or residual dendritic structure. Thus, ELEPHANT BRAND is a quality standard as well as a trade-mark for the original and finest phosphor bronze.

Your Seymour Representative is trained to help you solve metals problems. Why not call him today?

THE SEYMOUR MANUFACTURING COMPANY

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First in your file . . .
Apco Mossberg Company
Product: Steel reels, spools, bobbins
Address: Attleboro, Massachusetts
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FIRST IN QUALITY!

Whether you're looking for steel reels, spools or bobbins, you're sure to find the quality and service you expect under the world-famed *Apco Mossberg* name.

Backed by more than half a century of experience, *Apco Mossberg* engineers and craftsmen are prepared to meet your complete requirements for standard or custom-made reels, spools and bobbins . . . each to exact size, balance and trueness.

Be sure to look for the *Apco Mossberg* name the next time you consult your buyer's guide or product register. Our engineering and service departments will gladly submit recommendations based on your specifications at no obligation.

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APCO MOSSBERG COMPANY
LAMB STREET, ATTLEBORO, MASSACHUSETTS

New Book on Trade Association Law and Practice

Little, Brown & Co., 34 Beacon St., Boston 6, Mass., has issued a book "Trade Association Law and Practice", said to be the first to explain the antitrust laws as they apply to the modern trade association. It is of value to association executives, members, sales managers and all who have to do with marketing and distribution.

★ ★ ★

George P. Lamb and **Sumner S. Kittelle,** the authors, have drawn upon a wealth of experience in the practice of trade association law, in which they are acknowledged experts.

★ ★ ★

Part I is concerned with antitrust laws and trade associations as to functions and characteristics; Part II is devoted to trade association activities — standardization, prices, credit, research, patenting, etc.; and Part III deals with association organization and operation. All sections are documented with cases, rulings, statutes and other materials.

★ ★ ★

The book contains 284 pages of text and sells for $10.00.

Vertical CV

Vertical Continuous Vulcanizing wire insulating machinery, developed and manufactured by **Davis-Standard,** has proven highly successful in large scale commercial operation.

★ ★ ★

Designed to prevent transformation, scuffing and scoring of thick, spongy butyl insulation on large diameter wire and cable, the D-S Vertical CV machinery is the first of its kind in the extruded wire insulation field. Featuring a downward flow from the extruder, the Vertical CV process is especially suitable for larger conductors up to one and a half million circular mil with 15 KV ungrounded insulation.

★ ★ ★

An extruder crosshead tied in with a motorized steam splice box

with expansion allowances was developed by Davis-Standard specifically for vertical operation. These units feed the cable down into a vertical vulcanizing tube which has a patented water level control for gradated cooling of the insulation compound.

★ ★ ★

A combination unit housing a water seal and 48″ dual capstan had to be perfected for vertical operation with precise synchronization of the extruder and capstan drives. Located at the bottom of the line is a normal 72″ take-up, the only unit which required no special modification for Vertical CV production.

★ ★ ★

Operating well below its rated capacity, a famous D-S extruder with special crosshead, located at the top of the line, delivers uniform diameter, concentric insulation which has improved dielectric strength and corona level. The successful development of Vertical CV equipment is a direct result of the engineering ability and quality machinery that have made Davis-Standard a leader in the extrusion field.

Bulletin on Hot Work Die Steel

Firth Sterling Inc. announces the release of a new four page technical bulletin on three grades of its Hot Work Die Steel covering elevated temperature physical properties meeting aircraft specifications for structural parts. Two graphs on this subject are included, as well as a typical analysis of the three grades.

★ ★ ★

For a copy, please write the company at 3113 Forbes St., Pittsburgh 30, Pa., requesting Bulletin 13-2.

Get the habit of reading regularly
WIRE AND WIRE PRODUCTS
The Wire Man's Magazine

EFFICIENT, MODERN SYSTEMS
FOR
ELECTRICAL WIRE & CABLE MANUFACTURING

• *CABLE LACQUERING SYSTEMS*

Conventional cellulosic, or other type, lacquers are applied in successive continuous coats from one to twenty-eight coats over fibrous braid wrapped primary conductors. One end, four ends, or eight ends of wire are handled continuously. System includes letoff, application, drying and constant tension takeup equipment.

• *WIRE ENAMELING SYSTEMS*

Natural and synthetic enamels, silicones, solution nylon, modified plastisol, and similar insulating coatings are applied to bare, cotton or glass covered wire in round, square or rectangular cross section. Ten or twenty simultaneous strands are handled. Systems are complete with letoff, preannealer, application system, capstan and multiple takeup unit.

• *ASBESTOS INSULATING SYSTEMS*

Carded asbestos is applied to continuous single conductor as an integrated operation with saturating, rotary forming, drying, cooling and polishing of the finished wire. Wire from No. 20 gauge to No. 6 AWG is handled through an asbestos wall thickness range of from .008″ to .040″ thickness in a single pass.

• *RUBBER OR PLASTIC JACKETING SYSTEMS*

Rubber and thermoplastic jacketing compounds are continuously applied to electrical wire or cable by the extrusion method. High speed, constant tension letoff and takeup equipment, controlled cooling or continuous vulcanizing equipment are powered by synchronized range drives as complete, integrated wire handling systems. Extrusion machines of customer's choice are furnished.

• *GLASS & VARNISH COATING SYSTEMS*

Double layer of glass or cotton wrapping is applied to round, flat or square conductor. Two individual coatings of high temperature varnish are applied and the finish baked in a continuous operation. Units are complete from letoffs to takeup frames.

• *SELF TRAVERSING REEL CORD DRYERS*

These ingenious machines are used to remove hygroscopic moisture from fibers, braided or knitted flexible cable. These machines increase extrusion speeds, reduce blister scrap loss and improve diameter control. They are easily installed in existing extrusion line.

TECHNICAL INFORMATION ON ANY OF THESE PROCESSES UPON REQUEST

C. A. LITZLER CO., INC.
1817 BROOKPARK ROAD
CLEVELAND 9, OHIO

Outstanding Personalities of the Wire Industry

Armco Appointments

R. P. Tooke, Works Manager of the Butler Works, Armco Steel Corp., Butler, Pa., has announced the following appointments:

B. Chandler Huselton—Assistant to the Manager

Paul L. McKeever—Assistant Works Engineer

Ward B. Browning, Jr.—Assistant Works Engineer, Development and Construction.

★ ★ ★

The appointments represent promotions in each case, Huselton having been general foreman; McKeever was supervisor of electrical engineering; and Browning had been project engineeer for the Works construction program.

To Head Borax Research

Dr. Donald S. Taylor has been elected Vice President in charge of Research of the **United States Borax & Chemical Corp.,** to succeed **G. A. Connell** now retired, it is announced by **James M. Gerstley,** President.

★ ★ ★

Dr. Taylor, who will take over his new duties immediately, will make his headquarters in the Corporation's new $1,000,000 Research Center which is now nearing completion in Anaheim.

★ ★ ★

Last July, when the **Pacific Coast Borax Co.** merged with the United States Potash Company to form the United States Borax & Chemical Corp., Dr. Taylor was placed in charge of the combined companies accelerated research program, a post he has held until now.

★ ★ ★

It was also announced that **Richard F. Steel** has been appointed Assistant General Manager of the company. Last year he was elected Secretary-Treasurer.

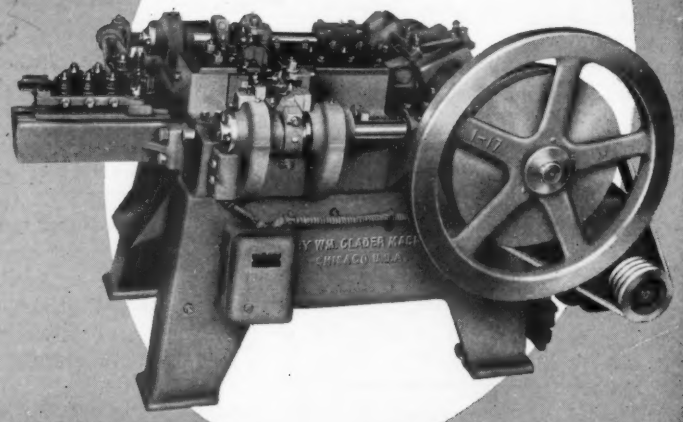
Leipold Elected President of Welcraft Products

Herbert O. Leipold has been elected president of **Welcraft Products Company, Inc.,** New Carlisle, Ind., manufacturer of heater wire, lead wire and wire harness assemblies for the appliance industry. He had been vice president and general manager.

★ ★ ★

Two other top-level personnel changes were also announced in the company's reorganization for future growth. **Theodore Budecki,** previously plant superintendent, steps into the role of vice president and factory manager, and **Woodrow A. Bowman** joins the firm in the capacity of industrial sales manager.

high efficiency — low cost
with GLADER wire nail machines



Eliminate costly down-time in the Nail Mill by replacing obsolete machines with new GLADER NAIL MACHINES . . . For tops in efficiency and economical operation use GLADERS.

WM. GLADER
MACHINE WORKS

210 N. RACINE AVENUE • CHICAGO 7, ILLINOIS

Export Dept.: 122 East 42nd Street, New York 17, N. Y.

Wins Oakite Service Award

Jonn Mackesy, a San Francisco representative of **Oakite Products, Inc.** for the past sixteen years, has been selected as the winner of the 1956 David C. Ball Award for Distinguished Oakite Service. The award, established in memory of the founder of the well-known industrial cleaning and metal treating firm, is given annually to the representative who "best carries forward with his customers the highest ideals of Oakite Service."

* * *

Mr. Mackesy, a native of Dublin, Ireland, covered the San Jose area before moving to San Francisco. He received the award from **John A. Carter**, company president, at Oakite's recent anniversary conference in New York City.

Westinghouse Appoints Engineers

Ronald N. Sampson and **I. R. Axelrad** have been appointed supervising engineers in the Insulation and Chemical Development Section of the Materials Engineering Department at **Westinghouse Electric Corp.**, East Pittsburgh, Pa.

Norton Appoints Production Manager

Paul L. Lantz has been appointed Production Manager of the Abrasive Division of **Norton Company.** He succeeds the late **George A. Fyrberg** who died April 6th.

* * *

Mr. Lantz had been assistant manager of the Industrial Engineering Department since the Fall of 1956. He is a graduate of Northeastern University and the School of Industrial Management at Worcester Polytechnic Institute.

C. F. & I. Directors Re-Elected

Stockholders of **The Colorado Fuel and Iron Corporation** voted at the annual meeting in Denver on May 1st to re-elect for three-year terms as directors of the corporation: **A. C. Bekaert, A. F. Franz, Charles R. Tyson,** and **William M. White.** Other members of the board who had been elected for three-year terms at previous annual meetings continue to serve.

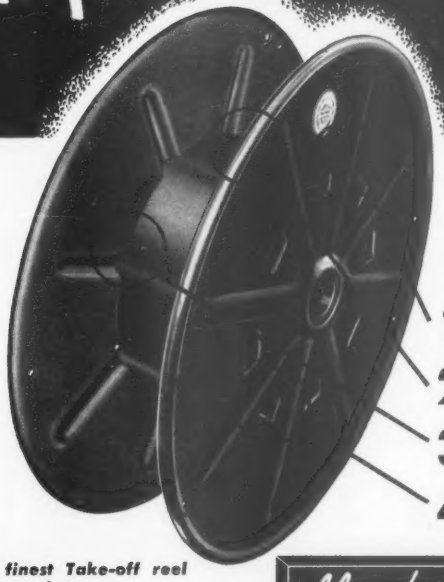
Heads Fastener Concern

Alexander I. Stayman has been elected president of the **American Nut & Bolt Fastener Company,** Pittsburgh. Mr. Stayman, who formerly was with the National Screw & Manufacturing Company, Cleveland, succeeds **Glen A. Aiken,** who is retiring as president after 43 years with the American Nut. **J. W. Brown,** secretary, has been elected to the additional post of treasurer.

To Produce Accelerator Dispersions

John Ware, formerly Vice-President of Kenrich Corporation, has organized the **Ware Chemical Corporation**, 80 Myrtle Avenue, West-

Important DIFFERENCES
BETWEEN JUST ANY REEL AND
All Welded MPS



TAKE-OFF REELS

Three important differences that mean longer reel life in both processing and handling of all types of insulated wires in your plant.

1. New MPS **deep wide, straight type embossed radial rib** adds considerable strength to reel heads over the old style narrow tapered rib.
2. **Increased height of the curled edge** adds even more strength and rigidity, especially to the rims.
3. Furnished with **rib fillers** that are projections on the end of the barrels that fit into the embossed radial ribs thereby **eliminating any marking of the plastic or rubber insulated** wires at the junction of head-barrel.
4. Finally, the **all welded "J" type construction** of the entire reel completes the picture.

The finest Take-off reel you can buy.
We invite your inquiries — let us tell you more about MPS Take-off Reels. Write us today.

Mossberg PRESSED STEEL Corporation

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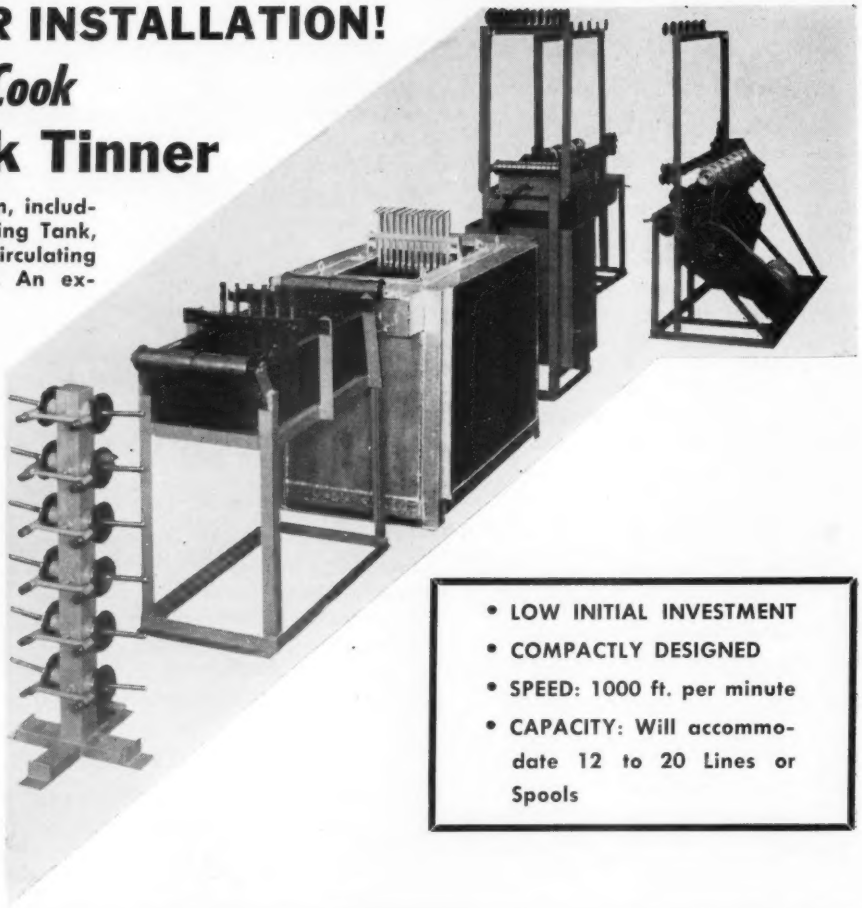
#109

NOW READY FOR INSTALLATION!

The New Cook

Hot-Dip Tank Tinner

Here's a complete tinning system, including: Supply Stand, Flux Pot, Tinning Tank, Water Cooling Tank with Recirculating Pump and Spool Take-Up Unit. An extremely fast unit producing uniformly tinned wire.



- **Can be built to accommodate customer's specifications as to supply and take-up spools.**

- **LOW INITIAL INVESTMENT**
- **COMPACTLY DESIGNED**
- **SPEED: 1000 ft. per minute**
- **CAPACITY: Will accommodate 12 to 20 Lines or Spools**

A complete Line of Quality Machinery For The Wire and Cable Industry To Meet Rigid Specifications.

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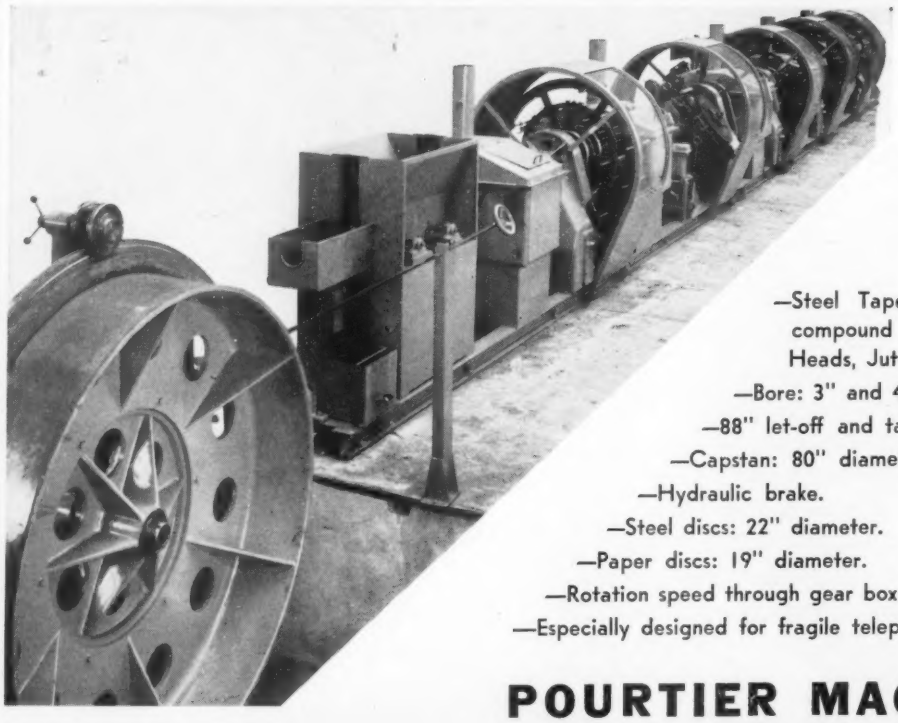
PATERSON, N. J.
ARMORY 4-6380



THERE IS ROOM IN YOUR PLANT FOR OUR

ARMOURING MACHINE

—Steel Tape Head, electrically heated compound Tanks, Powder Tank, Paper Heads, Jute Heads.
—Bore: 3" and 4½".
—88" let-off and take-up reels.
—Capstan: 80" diameter.
—Hydraulic brake.
—Steel discs: 22" diameter.
—Paper discs: 19" diameter.
—Rotation speed through gear box up to 240 r.p.m.
—Especially designed for fragile telephonic cables.

POURTIER MACHINES

153, rue Général Galliéni
ROMAINVILLE (Seine) FRANCE

port, Conn., for the purpose of producing a complete line of accelerator dispersions and other specialties for the rubber and plastic trade.

Elected a Vice President of Inso Products

Election of John Achelis as vice president in charge of sales of the newly formed **Inso Products, Ltd.,** a wholly-owned subsidiary of Adam Consolidated Industries, Inc., was announced by **Harold N. Leitman,** president of both firms.

★ ★ ★

Mr. Achelis will supervise the market development for Inso's exclusive new process for applying a thin film of insulation onto copper wire. This "Fused Film Wire" is expected to revolutionize the design of electrical components in airborne, electronic, appliance and allied industries by virtue of its ability to reduce the size of electronic equipment.

Heads Public and Industrial Relations for Chase

Peter S. Barno, of South Bend, Ind., has been elected Vice President, Public and Industrial Relations and a member of the board of directors of **Chase Brass & Copper Co.,** a subisidiary of **Kennecott Copper Corp.** Announcement of his election was made by **Glenn P. Bakken,** president, who said that Mr. Barno assumed his duties July 1.

★ ★ ★

He comes to Chase from Studebaker-Packard, South Bend, Ind., and succeeds **Rodney Chase,** who retired May 1. He joined Packard in 1952 as director of industrial relations and, after the 1954 merger, assumed the same post with Studebaker-Packard.

To Sell Carboloy Products in Flint

R. J. Jablonski, carbide design and application engineer for **General Electric's Metallurgical Products Dept.,** Detroit, has been appointed sales representative for Carboloy cemented carbide cutting tools in the Flint, Mich. area.

★ ★ ★

He succeeds Paul Kunz who recently was transferred to Houston, Texas. While in Detroit, he was responsible for co-ordinating field evaluations of new cutting materials.

★ ★ ★

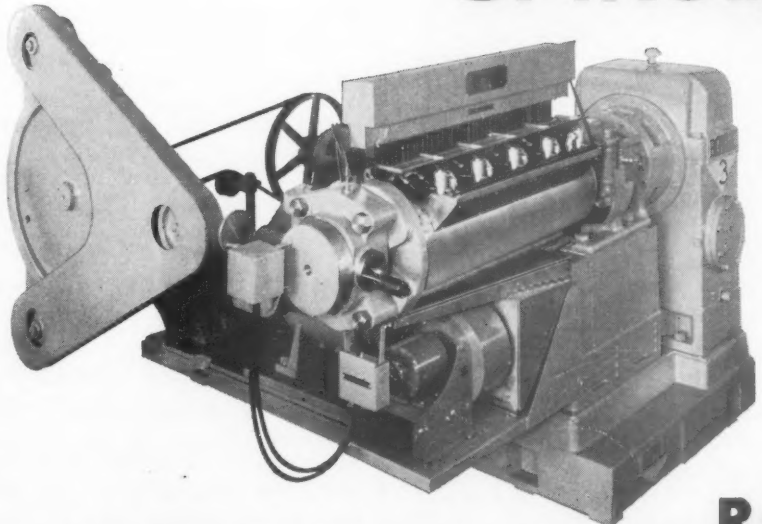
Prior to joining the Metallurgical Products Department 3 years ago, he was responsible for the development of improved tool designs and machining practices in the materials and processes laboratory of the company's Turbine Division in Schenectady, N. Y.

Appointed to Handle Pennsalt's Canadian Sales

The appointment of **John D. Fowler** to the sales staff of **Pennsalt** Chemicals has been announced

ROYLE

SPIROD®



for Rubber or Plastic Wire Insulating

These all electric extruders with radiant heat and high velocity evaporative cooling are designed to process either plastic or rubber compounds. The result of more than three quarters of a century of experience — Royle pioneered the extrusion process in 1880— in the design and construction of extruding machines time tested features have been built into Spirod to assure dependability.

Write for Bulletin #463

JOHN ROYLE & SONS

ROYLE PATERSON N. J. 1880

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

London, England
James Day (Machinery) Ltd.
Hyde Park 2430 - 0456

Home Office
V. M. Hovey J. W. VanRiper
SHerwood 2-8262

Akron, Ohio
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BLackstone 3-9222

Los Angeles, Cal.
H. M. Royal, Inc.
LUdlow 9-3261

Tokyo, Japan
Okura Trading Co., Ltd.
(56) 2130 - 2149

by Metal Processing Products Sales Manager **John M. Davidson.** Mr. Fowler will handle sales of the Pennsalt line of metal cleaners, phosphate coatings and cold working lubricants for the metal fabricating and finishing industries in Canada. He will work out of the Company's Hamilton, Ontario, office under the direction of **William B. Billingsley.**

★ ★ ★

Mr. Fowler, a graduate of Queen's University in Canada, was a technical service engineer with Consolidated Mining & Smelting Company of Canada, Ltd., prior to joining Pennsalt.

Industrial Sales Appointments by DuPont

Dr. John P. Wilkins has been appointed assistant manager of industrial sales of the **Du Pont Company's Film Dept.,** it has been announced. **Dr. William H. Wood** will succeed Dr. Wilkins as assistant manager of sales development and technical service, and **Harry S. Carl, Jr.,** will succeed Dr. Wood as a sales development supervisor. All appointments became effective on April 1st.

Appointed Purchasing Agent by Barnes-Gibson-Raymond

Norman Gardner has been appointed purchasing agent of the **Barnes-Gibson-Raymond Division of Associated Spring Corp.,** Plymouth, Mich., according to an announcement by **Charles J. Stofko,** general manager of the B-G-R division. He succeeds **Oscar Joseph,** who has been promoted to plant manager of B-G-R's Ann Arbor plant.

To Manage Engineering Group

An applied mechanics engineering group headed by **H. J. Siekmann** as newly-appointed manager, has been formed at **General Electric's Metallurgical Products Dept.,** Detroit.

★ ★ ★

According to **J. S. Gillespie,** manager of engineering, the new specialized unit, as part of the engineering section, will be responsible for obtaining basic information on physical properties, machinability, fundamental application requirements; and for performing stress analyses to guide material development. It also will help establish design and application criteria.

★ ★ ★

Mr. Siekmann for the past 3 years was in charge of the Department's machinability laboratory. He was responsible for much of the test and machinability data developed recently on the newer Carboloy cemented carbides and cemented oxides.

Clarification of News Item

In a recent news release, **Firth Sterling** announced the appointment of **Harry Davidson** as Canadian District Manager for **Firth Sterling (Canada) Ltd.** To clarify any misconception concerning Mr. Davidson's position, he will continue his duties as Asst. District Manager of the Ohio District. He has been selling in Canada for some time from his Cleveland headquarters.

What's your problem?
MAYBE WE CAN HELP!
We can design and make a lot of things besides spools. We have the imagination, the research facilities and the engineering experience to take tough problems off your hands. Why not tap that experience for your own use?
WHAT KIND OF A SPECIALTY DO YOU NEED?
• Special equipment?
• Specially designed machinery?
• A fabricated piece you can't get anywhere else?
• Experimental and development work?
Write or call us today
Acrometal makes a complete line of precision aluminum (and steel) spools for processing and shipping fine wire. Also disposable reels and packages up to 1,000 lbs. capacity.
ACROMETAL PRODUCTS, INC.
616 Fifth Street N., Minneapolis 1, Minn.

Oscar Sjogren

Oscar Sjogren, 76, President and Treasurer of the **Sjogren Tool and Machine Co.,** Auburn, Mass., died on June 26th, following a brief illness.

★ ★ ★

Mr. Sjogren was born in Sweden. He lived in Worcester from 1901 to 1906 and worked as a toolmaker for what is now the **American Steel and Wire Division** of the **United States Steel Corp.** and the **Wickwire Spencer Steel Division** of **The Colorado Fuel and Iron Corporation.**

★ ★ ★

He moved to nearby Auburn 51 years ago, where he founded his own business in 1927, which has continued throughout the years and is now operated by his sons.

AS&W Appoints P.A. in Cleveland-Pittsburgh District

Roger W. Berrett, purchasing agent of **U. S. Steel Corp.'s American Steel & Wire Div,** announced the appointment of **Elmer F. Ledvina** as chief clerk and buyer for the Cleveland-Pittsburgh District. He replaces F. J. Vaigl, who retired after almost 40 years of service.

★ ★ ★

Mr. Ledvina attended John Carroll University and Fenn College and began his Wire Division career as an office boy in the Purchasing Dept. in 1929.

Becomes Manager of Product Planning and Marketing Research

Howard W. Arnold, manager of distributor sales for General Electric's Metallurgical Products Department, Detroit, has been named manager of product planning and marketing research.

★ ★ ★

Mr. Arnold joined the Detroit Electric unit four years ago as a Carboloy carbide tool sales representative in the Chicago area. Previous to that, he was associated with General Electric's marketing services division in New York.

Armco Promotes Two Men

The appointment of two assistant works engineers for the Ashland Works of **Armco Steel Corporation** was announced by **J. M. Lobaugh,** Works Manager.

★ ★ ★

Warner Kenyon has been named assistant works engineer in charge of operations and **Lars R. Larson,** assistant works engineer in charge of development and construction.

★ ★ ★

Mr. Kenyon studied engineering at Purdue University and joined Armco in 1936. Mr. Larson is a graduate of Ohio State University with a degree in mechanical engineering and became associated with Armco in 1946.

NORBIDE Abrasive Grain... *cuts die Refinishing Costs!*

If you are still using costly diamond dust for refinishing your wire drawing dies, you'll be amazed at the savings you can make by switching to NORBIDE Abrasive. Wire mills everywhere have found that this abrasive—the hardest manufactured abrasive commercially available—is ideal for ripping and semi-finishing operations.

Many of our customers order NORBIDE Grain in 100 lb. drums. Many others order and re-order ¼ lb. and ½ lb. cans. No matter what your requirements are we can fill your order promptly from stock.

For details and prices on this cost-cutting abrasive write for Form 559.

NORTON®
BORON CARBIDE
Making better products... to make your products better
NORTON COMPANY
45 New Bond Street, Worcester 6, Mass.

NORTON PRODUCTS: Abrasives • Grinding Wheels • Grinding Machines • Refractories
BEHR-MANNING PRODUCTS: Coated Abrasives Sharpening Stones • Behr-cat Tapes.

NORBIDE® | *The hardest manufactured abrasive commercially available!*

A Review of Recent Wire Patents

The data listed below is only a brief review of recent patents pertinent to the readers and subscribers of this publication.

Complete copies of these patents may be obtained by writing to the publisher of this magazine and remitting 50c for each copy desired. For orders received from outside the United States the cost will be $1.00 per copy.

No. 2,794,225, ARTICLE SUPPORTING SPRING CLIP, patented June 4, 1957 by Harry M. Price, Sr., Leavenworth, Kans.

This clip is formed from a single strand of resilient wire, and may be used to clip onto the eye of a tag or the like.

★ ★ ★

No. 2,794,313, METHOD OF RECORING WIRE ROPE FROM THE BOTTOM, patented June 4, 1957 by Ottis M. Colliver, Ukiah, and Floyd E. Fuller, Fortuna, Calif.

The two claims of the patent are directed to the device itself, which is said to be adapted for leading the new core into the wire rope in a continuous manner and without the core becoming kinked or whipped due to the natural curvature of the new core.

No. 2,794,477, METHOD AND APPARATUS FOR MAKING COILED SPRINGS, patented June 4, 1957 by Curt H. Sjobohm, Worcester, Mass.

There are eight apparatus and one method claim. It is stated that a large variety of torsion springs of wire may be manufactured with this apparatus and for squaring the ends of the springs.

★ ★ ★

No. 2,794,493, SPRING BASE FOR SEAT CUSHIONS, patented June 4, 1957 by John G. Platt, Carthage, Mo., assignor to Flex-O-Lators, Inc., Carthage, Mo., a corporation of Missouri.

Means is provided in wire seat cushions for variable adjustments of the relative "softness" or "firmness" of the cushions.

★ ★ ★

No. 2,794,546, CARTONS, patented June 4, 1957 by William G. Miller, Clay, N. Y., assignor of one-fourth to Francis P. Keiper, Syracuse, N. Y.

A carton for coiled insulated conductor wire is disclosed, wherein the side walls of the carton are keyed to the side walls of the core.

★ ★ ★

No. 2,796,168 WIRE-FEEDING MECHANISM FOR NAIL-MAKING MACHINE, patented June 18, 1957 by Frank A. Clary, Jr., and Grant N. Willis, Bristol, Conn., assignors to Pittsburgh Steel Company, Pittsburgh, Pa., a corporation of Pennsylvania.

It is stated in the patent that there is provided feeding mechanism for rapid and positive gripping and release of the wire and for positive feeding of it to the heading mechanism.

★ ★ ★

No. 2,796,511, METHOD AND APPARATUS FOR JOINING WIRES BY BRAZING, patented June 18, 1957 by Maurice G. Steele, Rome, N. Y., assignor to Rome Cable Corporation, Rome, N. Y., a corporation of New York.

The methhod comprises clamping the wires end to end and then, while chilling the wires, heating the ends in an enclosed space with a pellet of brazing material between the ends and simultaneously moving at least one of them a predetermined distance toward the other to braze them.

★ ★ ★

No. 2,797,013, WIRE BASKET AND MANUFACTURE THEREOF, patented June 25, 1957 by Charles C. Powell, Massillon, Ohio.

The basket is composed wholly of wire strands. There are 12 claims.

★ ★ ★

SCHLATTER
WELDING MACHINE FOR REINFORCEMENT NETTING
Sole Representative: PAUL REICHER
MACHINERY & EQUIPMENT
P. O. Box 127, Willowdale, Ont., Canada
H.A. SCHLATTER LTD. ZOLLIKON/ZURICH
Manufacturers of electric welding machines (Switzerland)

New Department at Techalloy Operating

A new conversion department for wire and rod is now in operation at **Techalloy Company, Inc.**, Rahns, Pa. Special emphasis is placed on straightened and cut wire and rod not only in round, but also square, hex and other special shapes.

★ ★ ★

With this new department, Techalloy offers the widest possible range of wire and rod in special shapes. Diameters from ½″ down to .002″ or equivalent cross sections can be handled. Finished material can be ordered cut into any length from 2 inches to 12 feet.

★ ★ ★

In addition, this department also contains various types of annealing and pickling equipment needed for the ferrous and non-ferrous alloys that require special conversion.

★ ★ ★

Additional information is available from the manufacturer.

New Bulletin on Moly Lubes

"Breaking Lubrication Barriers", a 16-page brochure is four colors which completely covers the history and development of the molykote line of molybdenum disulfide lubricants has been published by **The Alpha Molykote Corp.**, Stamford, Conn.

★ ★ ★

A veritable textbook on the technical aspects of molybdenum disulfide as an extreme pressure lubricant, the bulletin covers the physical and chemical properties of the compound as well as providing charts which prove its superior lubricity.

★ ★ ★

Featured in the book are: (a) a catalog-type selection table; (b) four full pages of photographs showing a variety of uses; and (c) a section on bonded solid film lubricating coatings.

★ ★ ★

Copies of the bulletin may be obtained by writing to The Alpha Molykote Corp., 65 Harvard Avenue, Stamford, Conn.

New Handbook of Industrial Heating Facts

A new handbook designed to provide plant management and engineers with basic concepts of industrial heat processing and heat control is now being distributed on request by the **Michigan Oven Company.**

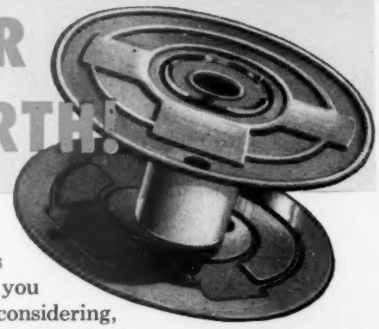
The busy plant executives concerned with heat processing costs and efficiency will find the MOCO "Fact Book" pruned of technical language. Here is a heat handbook that will carry him from a discussion of heat to fuel cost comparisons to design elements, in highly readable English.

★ ★ ★

Engineers, regardless of the type of heat processing they use,

If you use lightweight, non-returnable spools

GET ALL YOUR MONEY'S WORTH!



Only Masonware non-returnable spools offer you all these advantages in stock models. Compare the spool you are now using, or the spool you are considering, against this chart. See why Masonware spools give you *more* for your money. Then contact Masonware for full details on Masonware non-returnable spools.

	Masonware Spools	Brand A	Brand B
Lower Cost	✓		✓
Resists Crushing	✓	✓	
New, Lock-tight Construction	✓		
Heavily Tinned Barrel (inert & non-corrosive)	✓		
Light-Weight	✓		✓
Lithographed by Manufacturer	✓	✓	
Long Experience	✓	✓	

Use Masonware lightweight, non-returnable spools for

INSULATED WIRE
THERMO-COUPLE WIRE
TV LEAD-IN WIRE
AUTOMOTIVE CABLE
SOLDER WIRE
WEATHER STRIPPING
PLASTIC TUBING

MASONWARE SPOOLS AVAILABLE IN 3¾″, 5″, 6½″, 8½″ and 10½″ head sizes; 1⅞″ standard barrel diam.; 3½″ barrel diam. available for 10½″ head only; barrel lengths from ⅝″ to 14″; special sizes fabricated from your dies.

Let us solve your spool problem! Write, wire or call

MASONWARE COMPANY

1949 Dexter Road, East Providence, R. I. • Phone GEneva 4-2810
Branch Plant—Greenville, Ohio

will find MOCO's "Fact Book" a "refresher" course in process heating. The major consideration in modern oven construction, oven heat control, design objectives, etc. will acquaint them with recent process heating developments. The common formulas used in calculating heat and oven requirements are also included.

★ ★ ★

For your copy of the MOCO "Fact Book" write: Michigan Oven Company, 415 Brainard, Detroit 1, Michigan.

New Screw-Lock Bulletin

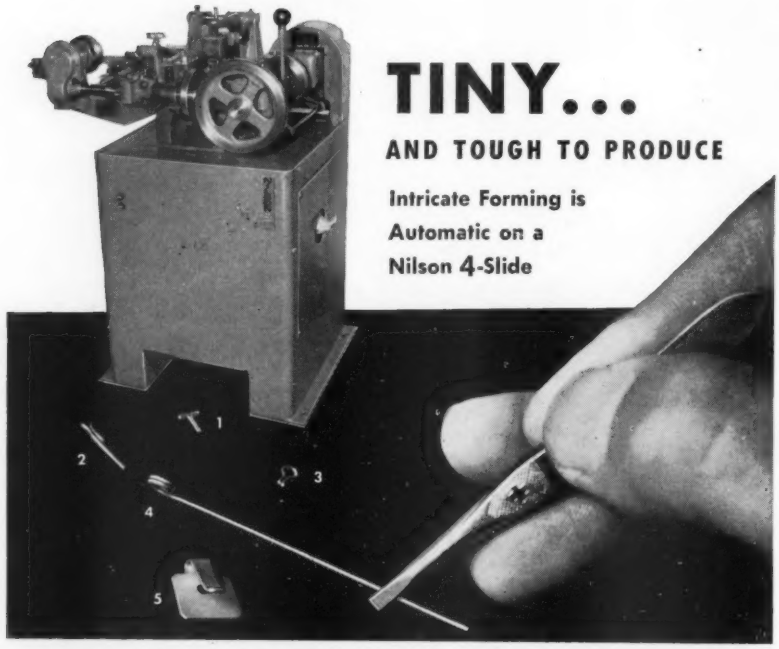
A new, 8-page specification bulletin has been issued by the **Heli-Coil Corp.**, Danbury, Conn., a Division of Topp Industries, Inc., on their complete line of Screw-Lock inserts, including the new miniature size 4-40 insert.

★ ★ ★

This bulletin contains Screw-Lock selection tables with thread sizes, insert numbers and sizes and complete information on drilling, tapping, gaging and installation. Line drawings and photographs illustrating proper installation of Screw-Lock inserts in both blind and through holes are included, as well as basic engineering design data, military specifications, classes of fit and assembly proportions. A variety of illustrated cost-cutting applications demonstrate the re-usable locking feature of the Screw-Lock insert to provide permanent threads in any material.

★ ★ ★

Copies of Bulletin No. 738 may be obtained by writing the company.



Small wire and ribbon metal forms shown here in actual size are typical examples of modern precision production on a Nilson #00 4-Slide. Compact in size, this 4-Slide produces up to 375 pieces per minute in material not exceeding .040 dia. and 3" in blank length. Easily access to tooling, accurate feeding to within .003, and rugged construction assures years of precision forming.

1 **Mercury Switch Part** . . . .014" x .019" platinum wire, formed with tolerances within .001" on over-all length. Production rate, 175 per minute.

2 **Electrical Contact** . . . .0076" x .0030" wide phosphor bronze formed at a production rate of 200 per minute.

3 **Swivel Part** . . . .025" brass wire. Heading operation includes eye formed with tolerances within .008", shank within .003 tolerance. Production rate, 300 per minute.

4 **Leadwire** . . . .026" soft tinned copper wire formed at a rate of 140 per minute with two 7/64" diameter windings.

5 **Contact Part** . . . .010" x 3/8" wide phosphor bronze formed at 175 per minute.

A.H. NILSON MACHINE COMPANY

1516 BRIDGEPORT AVENUE, SHELTON, CONN.

Automatic Chain Making Machines • Staple Forming Machines • Wire and Stock Reels • Wire Straightening Equipment • Slide Feeds for Presses • Wire and Ribbon Stock Forming Machines

Booklet on Motor Drives

A new eight-page, two-color booklet entitled "The Moving Force of Industry" describes in photos and captions the complete line of a-c. and d-c. motors, gearmotors, motor-generator sets, motor controls and complete packaged mechanical and electronic adjustable-speed drives engineered and manufactured by Reliance Electric and Engineering Company and the Reeves Pulley Division. The new booklet, designated Bulletin A-2501, is free for the asking by writing **Reliance Electric and Engineering Company**, 24701 Euclid Avenue, Cleveland 17, Ohio.

Handbook on Surface Treatment of Metals

A new 84-page booklet describing the latest developments in the surface treatment of metals is available to industry from **E. F. Houghton & Co.**

★ ★ ★

The handbook covers rust prevention, mechanical and chemical cleaning, blackening, phosphating and other aspects of the field of metal surface treatment.

★ ★ ★

Various treatment processes are diagrammed or illustrated photographically. The company's products available for surface treatment are also listed.

Write E. F. Houghton & Co., 303 West Lehigh Ave., Philadelphia 33, Pa., for your copy of "Surface Treatment of Metals".

Catalog on Electric Wire Printing Equipment

A new catalog covering engraved marking wheels and printing machinery has been issued by **Duncan M. Gillies Co., Inc.,** 66 Central Ave., West Boyleston, Mass.

★ ★ ★

It gives suggestions for ordering such equipment, which includes that for printing on both sides of the wire, for semi-spiral striping, regular printing, heavy duty wheels for large cables and extra large wheels.

★ ★ ★

For a copy, please write the company.

New Spring Coiler Bulletin

A new bulletin, picturing and describing the improved No. 0 Universal Spring Coiler has been issued by **Sleeper and Hartley, Inc.,** Box 1249, Worcester 1, Mass.

★ ★ ★

This model, fully covered in the bulletin as to operation and construction, features the recently developed unique escapement principle that contributes to both speed and accuracy in the production of coil springs.

★ ★ ★

Write to the company for a copy of the bulletin. It will be mailed promptly.

Anneals Weaving Wire in Salt Bath

Hanover Wire Cloth, Division of **Continental Copper and Steel Industries, Inc.,** Hanover, Pa., is getting top uniformity in their annealed wire through use of an electric "self-circulating" salt bath annealing furnace made by **Ajax Electric Co.,** Philadelphia. Plant Superintendent **R. E. Hirt** says circulation is provided by closely-spaced electrodes. The stirring action assures a uniform temperature throughout the bath and the annealed wire has no hard or soft spots. This means longer runs of the drawing and weaving machines and permits the company to turn out high quality wire consistently.

★ ★ ★

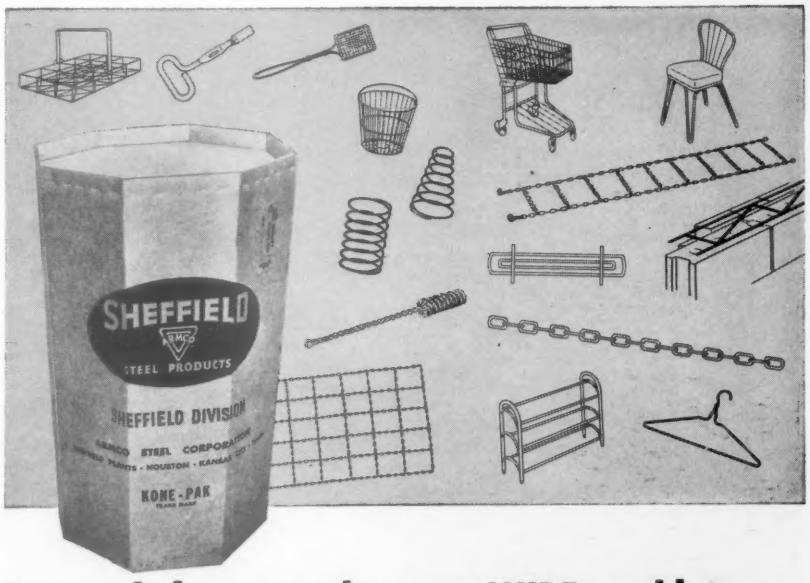
A secondary benefit of the automatic stirring is the extremely low maintenance required by the electric salt bath furnace. Localized overheating and "hot spots" in the pot are eliminated. Mr. Hirt says, "Maintenance is so low that we have required only one set of electrodes and three thermocouples in five years. We're still working on the original steel pot."

Selector Guide for Spring Wire

A selector Guide for nickel alloy spring wire is available without charge from **Techalloy Company, Inc.,** Rahns, Pa.

★ ★ ★

It discusses five methods of heat treatment of nickel alloys and the



Let us help untangle your WIRE problems...

We're old hands at it. If you use manufacturers' wire, you may have a lot to gain by getting in touch with your nearby Sheffield office. Our metallurgists and wire specialists can analyze your wire uses and make recommendations that may speed production, improve products and cut costs for you.

Sheffield's steelmaking and wire drawing facilities enable us to supply the right wire for any set of specifications. We're doing it for manufacturers and fabricators of more than 2000 different products. We'll not only come up with the right wire for you, but we are often able to recommend more economical ordering units.

Finally, there's Sheffield packaging. Our Kone-Pak* gives you in one continuous spool the equivalent of 2 to 40 ordinary coils. Kone-Pak saves handling and machine downtime for loading. With it comes the protection of specially treated wrapping that assures rust-free delivery and storage of your wire.

Just call your nearest Sheffield office.

**Pat. Pending*

SHEFFIELD
ARMCO
Wire Products

Sheffield serves the Midwest, Southwest and Gulf Coast with one of the most diversified lines of finished and semi-finished steel products in the steelmaking industry.

SHEFFIELD DIVISION ARMCO STEEL CORPORATION
SHEFFIELD PLANTS: HOUSTON • KANSAS CITY • TULSA — OFFICES IN PRINCIPAL CITIES

processing of springs: stress equalizing, stress relieving for uniform moduli, soft annealing, age hardening and solution annealing.

★ ★ ★

The Guide also shows the recommended thermal treatments for nickel alloy springs. In chart form 13 nickel alloy springs are listed with the specific values of temperature and time for stress equalizing and age hardening where these operations are recommended or possible.

Manufacturers in the spring, electronic, electrical, aircraft, guided missile, nut, bolt and fastener fields as well as purchasing agents and product design engineers will find Selector Guide a review that makes easier the choice of the proper alloy and the proper treatment for suggested applications.

New Process Adds to Stainless Steel Workability

A new patented process* for improving hot workability and increasing mill yields of stainless steels has been announced by **Armco Steel Corporation.**

★ ★ ★

Certain stainless steels have comparatively low ductility at hot working temperatures and may crack or tear in rolling operations. This is especially true of high alloy types, and can substantially reduce yields of usable mill products.

★ ★ ★

As a result of studies at Armco's Baltimore Works, it was found that traces of boron, 0.0001 to 0.0080%, added to austenitic chromium-nickel and chromium-manganese alloys greatly improves their hot working properties. Laboratory studies showed the effect on hot ductility is most marked in the range of 2000 to 2400F.

* "Stainless Steel Containing Boron," D. L. Loveless—U. S. Patent 2,750,283—June 12, 1956.

Driver Opens Louisville Warehouse

The Wilbur B. Driver Company, Newark, N. J., announces the opening of its Louisville office and warehouse at 139 St. Matthews Ave., Louisville 7, Ky.

★ ★ ★

R. E. Swift, District Sales Manager, will be in charge of this office serving the Southern states as far west as Texas. Electrical and heat resisting alloys will be stocked for prompt shipments to this area.

Rockbestos Opens Atlanta Office

Albert S. Rednay, President of **Rockbestos Products Corp.,** New Haven, Conn., manufacturers of insulated wire and cable, has announced the opening of a new office in Atlanta, Ga., and the appointment of **Luther Rudisill** to take charge of sales in the South.

★ ★ ★

Mr. Rudisill was formerly connected with the Radio and Television Division of Westinghouse and before that was Chief Engineer in the laboratories of the Raytheon Manufacturing Co.

Photo Courtesy of Bedford Wire & Cable Corp.

PLYMKRAFT

CABLE FILLER

for Savings in a Good-Looking Cable

You save time and money in your cabling operation when you use Plymkraft Cable Filler. Its greater fill capacity, greater uniformity, assure you of a better looking cable. Made to fit your particular standard of manufacturing, Plymkraft is available in any type of put up and ready to use. Whether it is treated with wax, jute saturant, or anthracene, Plymkraft is made to meet your moisture requirement in cables. Smooth running Plymkraft is also ideal for highspeed cablers where extra strength is a must. Use Plymkraft Cable Filler, your best bet for clean, efficient cabling.

To keep up to date with cable filler developments, it takes only an inquiry for samples of Plymkraft. To find the quality cable filler best suited for your wire needs, write today to:

PLYMKRAFT DIVISION

PLYMKRAFT CORDAGE COMPANY

PLYMOUTH, MASSACHUSETTS

Specification Index Issued by American Brass

Publication of a new, enlarged edition of "Copper & Copper-Alloy Specifications Index" is announced by **The American Brass Company.** The 28-page booklet is divided into three parts.

★ ★ ★

Section I is a list of the most generally used alloys and products of the company, together with the applicable specifications of the eight following agencies: ASTM, ASME, AWS, SAE, AMS, Federal, Military, and Joint Army-Navy.

★ ★ ★

Section II lists specifications in numeric order with a brief description of the material as to alloy, grade, type, temper, anneal, etc.

★ ★ ★

Section III tabulates chemical compositions of all Anaconda Metals covered by standard specifications. The compositions are arranged numerically by alloy numbers for quick cross reference when using either Section I or II of the Index. This is a new section.

★ ★ ★

Copies are available by writing for Publication B-34, 7th Edition. Address The American Brass Co., Dept. RS, Waterbury 20, Conn.

Carboloy Die Prices Reduced

While prices of most hard goods are climbing due to high labor and materials costs, **General Electric's Metallurgical Products Dept.,** through engineering and manufacturing advances, has reduced prices on cemented carbide dies a minimum of 20 per cent.

★ ★ ★

The lower prices cover standard Carboloy carbide round hole dies, mandrel nibs, finished mandrels, header die nibs, hexagon and square dies and nail gripper die nibs.

★ ★ ★

The dies are used for wire, bar and tubing operations, ferrous and nonferrous extruding and nail making.

Insulations of the Future

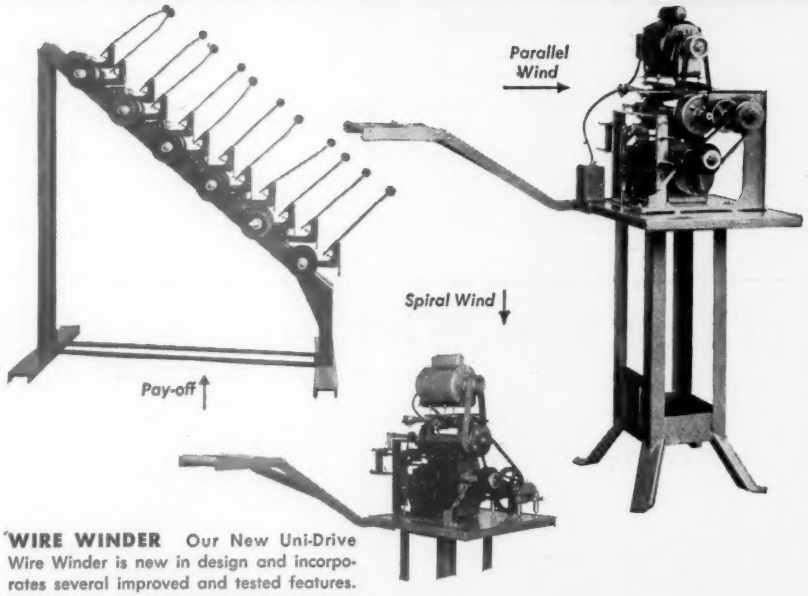
(*Continued from page* 898)

pense if added to the cable plant. Unless major material improvements can be obtained that cannot be accomplished by lower cost methods it is doubtful that irradiation will play a big future role in power cable insulation. It may have a definite part in the production of certain cable components such as tapes.

★ ★ ★

Cable engineers are indeed grateful for some of the "tools" which have been developed and pioneered by IPCEA in recent years towards proper evaluation of new cable insulations and designs. Included in this category are the moisture stability tests, corona-level measurements and a procedure for determining suitability of an insulation for use on d-c circuits in wet locations. Such tests are now generally accepted through IPCEA-NEMA coordinated efforts and will help to prove in and safe guard the application of new materials and designs. As engineers

STANDARD UNI-DRIVE WIRE WINDER



WIRE WINDER Our New Uni-Drive Wire Winder is new in design and incorporates several improved and tested features. Production is stepped up through increased speed. It produces smooth, even and accurately wound spools of wire in single or multiple ends. All strands parallel — no over or under-winding. Can also be furnished with a slight spiral pattern for winding exceedingly fine wire. Automatic Stop Motion controls each strand. Traverse adjustable from 1¾" to 5½" between spool heads without changing cam. Designed especially for winding wire to be braided and shielded for electrical conductors.

Various types of supply packages that may be wound on Standard Uni-Drive Wire Winder.

PAY-OFF Our Pay-off Attachment consists of a heavy fabricated frame on which Pay-off spools are mounted to cover desired number of ends to be wound. Equipped with spindles, running on self-aligning ball bearings, with size of spindles and adapters to accommodate customers' pay-off spool. Compensating Attachment to control the tension of each individual strand of wire, applying the same tension when spool is full as when empty. Can also be adapted for use with bunching machines.

STANDARD MILL SUPPLY COMPANY
31 ESTEN AVENUE PAWTUCKET, R. I., U. S. A.

we should constantly look for additional tools or tests to accurately and dependably predict performance. For example, the established principles of "shielding" must not be overlooked if new materials and new cable designs are to provide trouble-free operation on power distribution circuits.

★ ★ ★

There seems to be a growing trend towards higher temperature insulations but insofar as power cable is concerned there is a definite value beyond which it becomes neither technically nor economically sound. For example, even on a bare conductor without any insulation such as overhead distribution lines the continuous temperature of operation seldom exceeds 90° C because the conductor losses become excessive and system operation and economy is impaired. It is generally more prudent to increase conductor size rather than push more amperes through the same conductor—one of the philosophies behind "adequate wiring."

Many of the newer insulations have reached a temperature threshold (200° C and higher) that may well exceed the temperature ability of the metallic conductor (copper or aluminum). This important problem must be considered and has been under investigation. It is true that higher temperature insulations will provide increased overload protection and a greater factor of safety during normal operation but we have approached the line beyond which it would **not** seem to be feasible to recommend much higher continuous operating temperatures—even by inference. So let us beware with some of these insulations of the future that we do not establish impractical operation standards or go too far on a wrong track.

★ ★ ★

It is probably the fond hope or dream of most cable engineers to discover **the** one insulation which is the cure-all for every job and would become the one standard and preferred cable for all power uses. This is a lovely thought—but I have been around just long enough to strongly believe that history repeats itself so I would bet against such a situation for a long, long time to come.

Carlson Company Moves

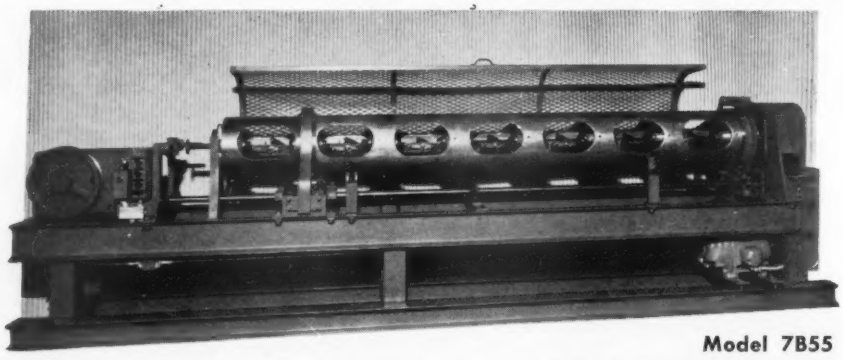
Harold C. R. Carlson, Consulting Engineer and head of **The Carlson Company,** has announced the removal of his business to a new office and plant at 3457 Weidner Ave., Oceanside, L. I., N. Y.

★ ★ ★

The company manufactures spring coilers, grinders and testers, gages, looping tools and special machinery, in addition to which Mr. Carlson, a Professional Engineer, renders consulting services on equipment design, spring design, metallurgy, heat treatment, plant layout and other engineering matters.

SEVEN BAY HI-SPEED STRANDER

Stranders also available with 6, 7, 12 or 18 bay construction



Model 7B55

DESIGNED AND MANUFACTURED FOR ARMY SIGNAL CORPS WD-1/TT FIELD WIRE EQUIPMENT PROGRAM

Introduced in 1951 and has received wide acceptance . . . users report SUPERIOR performance. A departure from 50 years of steel barrel construction . . . utilizes the latest high strength aluminum alloy barrel . . . eliminates useless weight, increases speed, and reduces operating costs.

For complete information write to . . .

BARTELL

BARTELL MACHINE-TOOL CORP.

ROME, NEW YORK

Serving the Wire Industry Since 1940

Expansion and Modernization Program of Roebling's Electrical Wire Division Well Advanced

(*Continued from page* 899)

As much as 3,000 feet of cable can be placed on one reel at the takeup end. The quality of the cable thus produced, Roebling engineers state, has far exceeded expectations and is a major contribution to cable manufacturing methods.

New Cabling Machine

For a new 32,000 square foot building a mammoth Watson planetary cabling machine is in the process of being installed. It is made to accommodate 3 or 4 main bobbins and can produce longer than conventional lengths of cables, when needed.

★ ★ ★

Provision for smaller bobbins has been built into the mechanism for the manufacture of gas-filled power cables of the low and medium pressure types. This will be a new product for Roebling, to be produced in response to increasing demand from the utilities for this type, because of the self-supervisory characteristics of gas-filled cables.

★ ★ ★

The new building will also house a new vulcanizing tube for the continuous vulcanization of neoprene protective coatings over lead sheaths, equipment for the application of metallic sheaths, large oil impregnating tanks and vacuum drying and testing equipment.

Planning the final stages of Roebling's Electrical Wire Division expansion program are (left to right): W. C. Ridge, works manager; F. A. French, chief plant engineer; Charles R. Tyson, executive vice president; and C. R. Wentz, manufacturing manager for the Division.

★ ★ ★

Among the other new machines being installed is a new No. 11 Banbury mixer that will handle 500 to 600 pound batches of rubber. It is provided with the latest type tubular strainer and is expected to add considerably to the uniformity and quality of the insulating material to be extruded onto the cables.

★ ★ ★

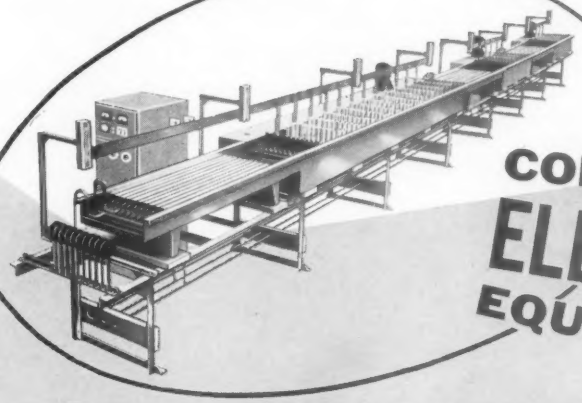
For the many new operations in the plant, the company has spent a million dollars on re-wiring. Current is brought in at 25,000 volts and stepped down in transformers to 400 volts for use in the equipment.

★ ★ ★

As there is a constantly increasing trend toward large cable lengths and higher voltages in power distributing systems, the

CUT WIRE PLATING COST!

maintain uniformity on copper and aluminum wire



CONTINUOUS U.I.E.C. ELECTROPLATING EQUIPMENT

This low cost equipment performs uniform high quality work at speeds that mean real savings. Simple to operate. We furnish complete installation.

Write today to:

UNIVERSAL INDUSTRIAL EQUIPMENT CO.

SECAUCUS, NEW JERSEY

Sole agent in Canada: E. V. LARSON CO., LTD., TORONTO, CANADA

program at Roebling's will be helping to meet the growing needs of the power companies and of industry.

★ ★ ★

Needless to say, all of the new installations have not been detailed.

★ ★ ★

There will be much of more than passing interest to be seen when the Buckthorn Plant is visited during the Annual Convention of The Wire Association in 1958.

Republic Steel Making Pre-Fab Buildings

Republic Steel Corporation has announced a new all-metal "standard building" that can be delivered "off the shelf."

★ ★ ★

Manufactured by Republic Steel's Truscon Division, Youngstown, Ohio, the buildings are delivered to the job site as a "package"—with siding, roofing, windows, doors and hardware included. Truscon construction men and engineers supervise construction. The customer only has to provide the floor or base for the building.

"Clean-Tact"

Standard Industrial Compounds Company, Inc., Frankfort, Ill., has developed a new product for the cleaning and lubrication of sliding electrical contacts. The product trade name is "Clean-Tact". Clean-Tact will dissolve the metallic oxides and sulfides that form on the surface of the contacts. The chemical action stops at the metal and is completely harmless both to the contacts and surrounding materials. The product is available in pint cans and larger quantities as well as a unique type of pen dispenser that will reach inaccessible points for small drop applications. Clean-Tact is also packaged in an aerosol spray dispenser six ounce can for application on large surfaces. After the chemicals have dissolved the undesirable coatings, the remaining ingredients continue to function as a protective coating and a lubricant for the sliding action.

★ ★ ★

Complete information is available by writing to the manufacturer, Standard Industrial Compounds Company, Inc., Frankfort, Illinois.

Crucible Steel Opens New Warehouse

Crucible Steel Company of America formally opened its expanded specialty steel warehouse at 4501 West Cortland St., Chicago 39, Ill., by playing host to over 600 industrialists and businessmen on June 13th.

★ ★ ★

D. K. Stuart, Chicago Branch Manager, and **E. K. Streeter,** former Manager and presently Midwestern Regional Manager, together with administrative personnel from Crucible's Home Office in Pittsburgh, were present to greet visitors and escort them around the expanded facility.

Sjogren
WELDING ROD COILER
Another specially designed machine for a specific purpose!
This Sjogren designed and built Welding Rod Coiling machine has many advantages for the user. It will pre-cast welding rod wire to any required spool curvature from 12" I.D. to 25" I.D. after straightening the wire from the coil and passing it through a mechanical counter that measures pre-determined footages. The pinch rolls are driven from a GE Speed Variator with motorized rheostat for slow acceleration to pre-determined speeds ranging from 57 to 900 feet per minute.
The spool is driven by a variable torque motor. Traverse mechanism is easily adjustable for various wire diameters and is kept in perfect syncronization to spool speed by use of a tachometer generator feeding back through the electronic equipment.
For 1/16" to 3/8" wire diameters
USED BY WIRE MEN WHO WANT THE BEST!
Sjogren
SINCE S&S 1927
TOOL & MACHINE CO., INC.
WIRE PULLERS • WEDGE GRIPS • JAWS FOR ALL MAKES OF PULLERS AND TESTING MACHINES • CAGE ROLLERS • SWAGING HAMMERS • POINTING DIES • WIRE SPOOLERS
14 Sword St.
AUBURN, MASS.

Universal Sorting Machine

Sorting anything from bearing balls to gears and piston pins into as many as thirteen categories is now possible on the E. A. M. "Autosorter." The "Autosorter" is based upon a new no-drift electronic principle of gauging plus a unique and simple mechanical memory system. The same machine can be used for increments anywhere from ten millionths to ten thousandths.

★ ★ ★

Accuracy between classes is guaranteed as low as .000002". The speed range averages around 10,000 pieces per hour, depending upon the size and type of the piece.

★ ★ ★

For visual inspection of balls and rollers, a stroboscopic light in window indicates out of roundness. The equipment is compact and portable, requiring practically no maintenance.

★ ★ ★

For further information, write EAM Div., **Industrial Gauges Corp.**, West Englewood, N. J.

Extrusion Press to be Built for Titan

Sutton Engineering Company of Pittsburgh, Pa., has announced the purchase of a new 1500 ton Sutton extrusion press by **Titan Metal Manufacturing Co.**, Bellefonte, Pa.

★ ★ ★

The new unit is the second Sutton extrusion press to be purchased by Titan. Capacity will be double that of the first press. It will be installed at Titan's new West Division plant at Newark, Calif., for the extrusion of brass and copper alloys.

★ ★ ★

The press is to be operated by a self-contained oil hydraulic power system at initial speeds of close to 100 inches per minute. Provision is to be made for future addition of pumping capacity to attain extrusion speeds up to 135 inches per minute.

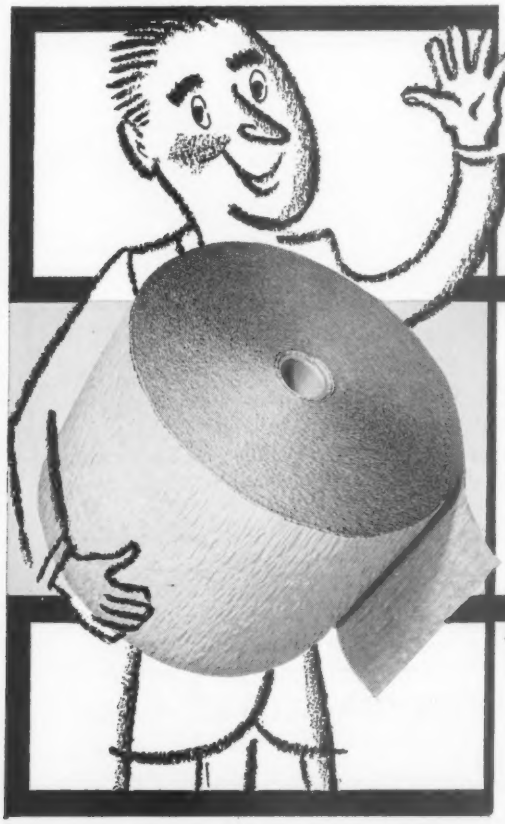
To Work on Plastics Development

Erhart K. Drechsel has joined **Escambia Chemical Corp.**, it has been announced by **A. N. Wohlwend,** vice president and director of commercial development.

★ ★ ★

He will be located at company headquarters, 261 Madison Ave., New York City, and will devote full time to commercial development activities. He joins Escambia from American Cyanamid Co., where he was a Product Manager in their New Product Development Dept. Prior to this, he was a Senior Market Analyst in Cyanamid's Market Research Department and had spent a number of years as a Research Chemist in their Stamford Research Laboratory. He holds an A.B. degree from Drew University and an M.S. from Syracuse University.

★ ★ ★



HERE ARE 5 GOOD REASONS FOR USING Rinkle Krinkle Spiral Wrap

1. Only No. 1 Northern Kraft Paper is used in the manufacture of Rinkle Krinkle Spiral Wrap.
2. Rolls can be supplied in any weight, width, or diameter.
3. It is manufactured by a company that has 30 years experience making spiral wrap exclusively.
4. Items wrapped with Rinkle Krinkle Spiral Wrap are very attractive, which greatly increases sales appeal.
5. Five types available include Krinkle Kraft, Krinkle Waxo, Krinkle Waterproof, Krinkle Nylon Reinforced, and Krinkle Resin Laminated.

If you use Rinkle Krinkle Spiral Wrap once, you will want to use it every time.

Rinkle Krinkle Paper Company

MEMBER WAS

326 A STREET, BOSTON 10, MASS.

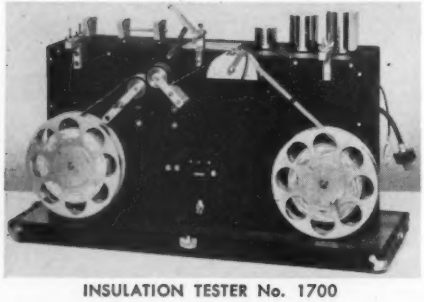
COPPER - Consumption of refined copper in the United States March-April 1957, in short tons

	Wire mills 1/	Brass mills 2/	Chemical plants	Secondary copper smelters	Foundries and miscellaneous	Total
March:						
Cathodes	721	6,716	(3)	67	(3)	7,504
Wire bars	66,409	4,898	(3)	---	(3)	71,307
Ingots and ingot bars	1,503	5,777	(3)	130	(3)	7,410
Cakes and slabs	------	13,348	(3)	---	(3)	13,348
Billets	------	11,524	(3)	---	(3)	11,524
Other	------	------	(3)	54	(3)	54
Total	68,633	42,263	(4)	251	(4)	4/114,147
April:						
Cathodes	602	7,755	(3)	91	(3)	8,448
Wire bars	69,869	5,035	(3)	---	(3)	74,904
Ingots and ingot bars	1,097	6,413	(3)	102	(3)	7,612
Cakes and slabs	------	15,295	(3)	1	(3)	15,296
Billets	------	12,846	(3)	---	(3)	12,846
Other	84	------	(3)	44	(3)	128
Total	71,652	47,344	(4)	238	(4)	4/122,234

1/ Includes all wire mills with rod-rolling facilities. 2/ Includes all brass mills using copper in refinery shapes; some have rod-rolling facilities. 3/ Not available. 4/ Consumption by chemical plants, foundries, and miscellaneous plants not included. Estimate of 3,000 tons included in total.

Janco

QUALIFIED ELECTRO-MECHANICAL PRODUCTS FOR THE AIRCRAFT AND MISSILE INDUSTRIES



INSULATION TESTER No. 1700

The **JANCO** Abrasive Insulation Tester No. 1700 is specifically manufactured to MIL-T-5438. As a LABORATORY STANDARD, this system provides an abrasion resistance comparison of insulation for aircraft electronic wire and cable in accordance with the following specifications:

AN-JC-48a **MIL-W-5274**
AN-C-161 (1) **AN-C-168**
USAF 32659

Ruggedly designed and portable for field use, the **JANCO** Tester is ideally suited for laboratory, production and receiving inspection applications.

ADDITIONAL JANCO PRODUCTS

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- SHUNTS-AMMETER
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- FLAG TERMINALS
- JUMPERS-BONDING, DISCONNECT, POWER & ELECTRONIC
- HEAVY DUTY LIMIT SWITCHES
- ROTARY MULTI-POLE SWITCHES
- ANTENNA SHOCK LINKS

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JANCO CORPORATION

3111 WINONA AVENUE
BURBANK, CALIFORNIA

TWX BRB-7358

Okonite Opens New Plant in New Jersey

The Okonite Company formally opened its new plant in North Brunswick, N. J., on June 20th, having completed the transfer of its operations from Wilkes Barre, Pa.

★ ★ ★

Originally built as an assembly plant for Studebaker cars, the plant was bought by Okonite a year ago and has been in the process of being remodeled since that time to make one of the most modern cable producing mills in the country.

★ ★ ★

Much equipment was moved from the old plant, to which some two million dollars worth of new machinery of the latest design has been added. The plant measures 1400 feet long by 360 feet wide and is located on Route 1 where it crosses the Pennsylvania Railroad.

High Convection Wire and Rod Annealing

(*Continued from page* 891)

an aspirating affect at the bottom of the stems caused by the flow of gases between the diffuser vanes.

★ ★ ★

Because of the flow pattern, two possibilities are evident; multiple stem loading for rods and higher fuel inputs, both of which will increase production over a given period of time as compared to the older type equipment. Formerly, rod furnaces were sized for single stem loading, since the only assurance of uniformity of heating was to surround a single stem with a heat source and allow the radiation to contact the work as evenly as possible. In the high convection furnace, the stream of gases transfers part of the radiant heat from the inner cover to all parts of the charge as well as modulating the temperature from one point to another in the charge. Since the gases are a moving transfer medium, more heat can be applied without danger of localized overheating.

★ ★ ★

While much of the foregoing description has been in the line of furnaces of new design, it will be gratifying for the wire industry to know that their existing furnaces could be rebuilt to this new design for sizes of 48 inches, 62 inches or

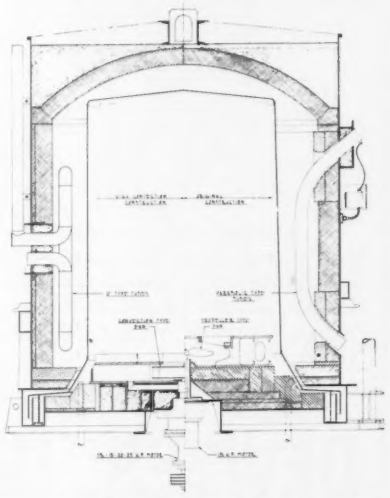
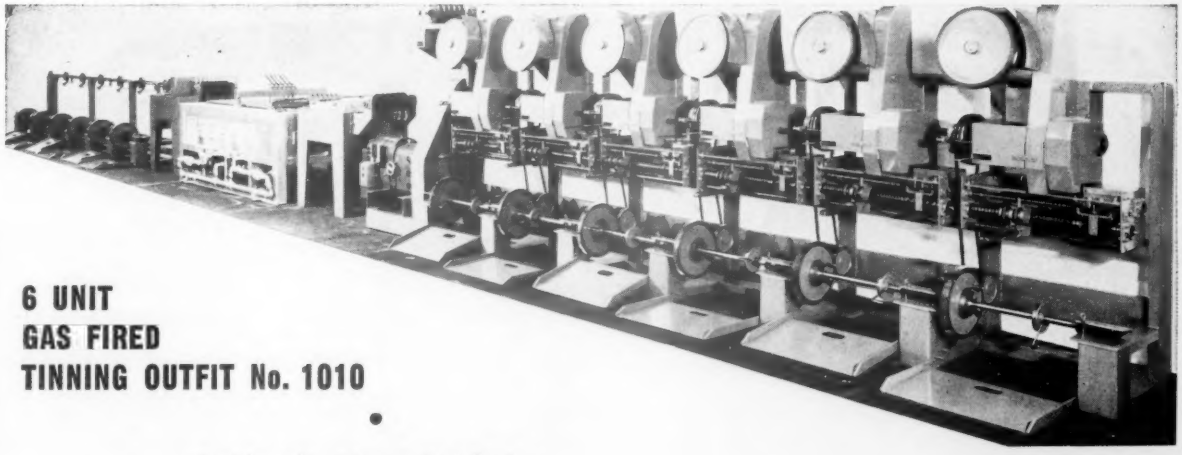


Figure 5.



6 UNIT
GAS FIRED
TINNING OUTFIT No. 1010

Send for information on the following:

WIRE ANNEALING, TINNING and GALVANIZING OUTFITS

MULTIPLE or SINGLE UNIT WIRE TAKE-UPS

FINE WIRE DRAWING MACHINES

MAGNET WIRE ENAMELING EQUIPMENT, INCLUDING

PRE-ANNEALERS, SYNTHETIC ENAMEL APPLICATORS and CIRCULATING SYSTEMS

COTTON, GLASS-FIBRE and TAPE COVERING MACHINES

EST. 1855 AIMCO INC. 1915

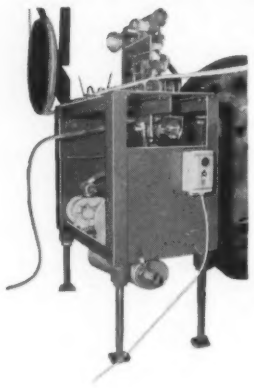
"American" AIM INSULATING MACHINERY COMPANY

REG. U.S. PAT. OFF.

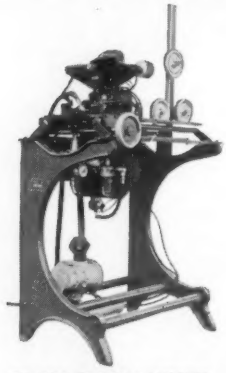
FAIRHILL AND HUNTINGDON STREETS

PHILADELPHIA 33 PENNSYLVANIA U.S.A.

LABELING MACHINES for WIRE and CABLE



SE-300 SERVICE ENTRANCE LABELING MACHINE.
Designed for labeling Service Entrance Cable. Will apply a UL label every 20 feet. Fully automatic. Speed limited only by the speed of the wire.



FA-200 FLAG LABELER.
This machine has high operating efficiency—up to 3000 labels per hour. Used before an Artos Cutter, with speed governed by cutter. Completely automatic. Space available on labels for advertising.

Write today for detailed information.

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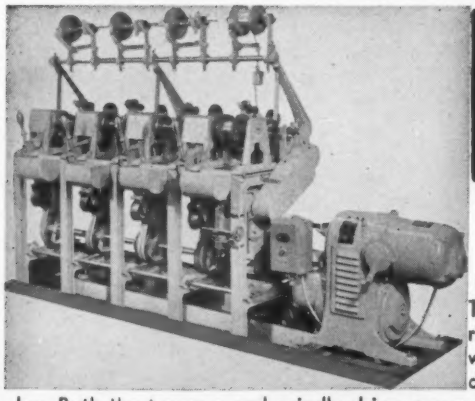


1900-HV MULTIPLE SPINDLE SPOOLER

SPECIFICATIONS
Size Range: .010" to .080" or heavier if soft and many flat wire sizes.
Max. Spool Size: 16" flange diameter.
Capacity: usually 4 to 8 spindles.

The 1900-HV Spooler is a rigid, precision machine which will consistently produce a uniform, dense wire lay. Both the traverse and spindle drives are regulated through wide-range, stepless, variable speed units, eliminating change gears. The 1900-HV is completely adaptable to your particular constant or changing demands. All controls are positive. Adjustments are made accurately with the spooler in operation and without tools.

Both smooth acceleration and rapid stopping is obtained through a single lever at each station. Spool changing is simple and rapid. Anti-friction bearings are used on all shafting and spindles.

Your special requirements can be incorporated into the design. Each machine is delivered ready for operation from your power supply. Payoff stands furnished as extras.

Consult us on your spooling problems.

ROBERT J. EMORY COMPANY
31 East Runyon Street Newark 5, N. J.

74 inches. Figure #5 shows the comparison of construction between the older furnaces with small fans and parabolic-type heating tubes and the new high convection units. Existing piping, wiring and steel work can be used and the exchange made at less than the cost of new equipment.

★ ★ ★

Now, as to the results that can be obtained from this type of equipment, some general and specific comments can be made. In general, time to temperature can be cut in half, as compared to older equipment. For rod spheroidizing operations, three stems of rods can be treated in no longer time than is required for operation on a single stem and at a lower initial investment. On process or low carbon wire annealing, the yields from these furnaces for given sizes will increase 40 to 50 per cent. For instance, on a 74 inch diameter furnace which produced 2000 pounds per hour of low carbon wire annealing, the yield went up to 3000 pounds per hour on the high convection type.

★ ★ ★

This new equipment offers a tremendous step forward in productive possibilities, with uniformity of physical properties and metallurgical structure to meet all required specifications at these high rates of production.

Welding Rod Comparison Chart

An informative and useful 4-page folder, Bulletin DH-1218-K, has been prepared by the **Page Steel and Wire Div., American Chain & Cable Company, Inc.,** Monessen, Pa.

★ ★ ★

It details physical properties, gives analysis, tensile strength, elongation, average Rockwell hardness and lists typical uses of gas welding rods, bare electrodes, automatic welding wire and metal spray wire. Comparisons between the Page products and most competitive makes are listed.

Handling and Storage of Wire Products

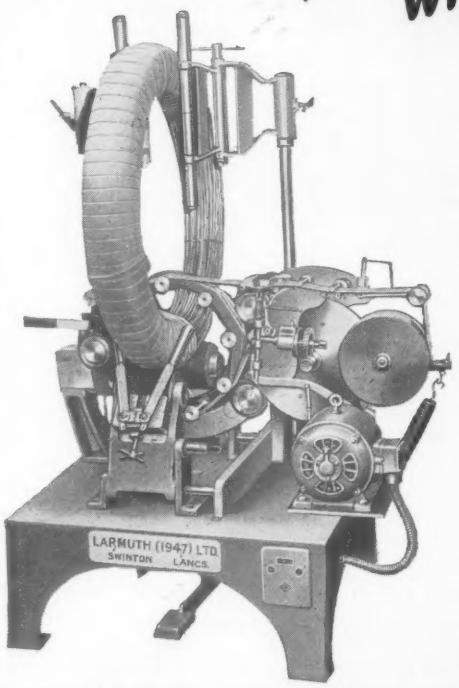
(*Continued from page* 882)

Market wire is bundled by a strapping machine. Dry, brite market wire is bundled and loaded into open ended bins that can easily be ram truck unloaded without further man handling. Wire scheduled directly into the rope shop is loaded into bins in job lot quantities and moved directly to the wire spooling. From the spoolers the wire is stranded and closed into wire rope. Rope wire scheduled into storage for future production is placed into bins. 470 of these bins are used all over the plant, but, show up their real value in rope wire storage. Of necessity, we store a full month's supply of rope wire in a limited area. A bin can safely hold up to 12,000 lbs. of finished coiled wire in either 8 inch, 12 inch, 16 inch or 22 inch coils. The legs of these bins engage into the top of other bins and are stacked three high by a ten ton electric two way warehouse crane. In as small an area as 7 feet by 25 feet, we can store 100,000 lbs. of wire leaving a safe working passage for the warehouseman and a trucking passageway. A 5 ton platform electric truck services the transportation needs of the rope wire storage. This system of handling and storage is some thirty years old, but, is still adequate.

★ ★ ★

Returning again to our Wire Mill operation finds reels being loaded with low carbon wire to be galvanized for fish trap netting, twisted stucco netting, and market wire. These reels handle about one ton of single length wire and are transported by suspension from the boom of a ram truck. Placement of these reels is directly into the galvanize unit where the butt welding of one to the next gives a continuous supply of wire. Snarl switches and a remote control panel at the operator's fingertips gives exceptional control to this unit. This system was modernized to our own planning within the past year and is proving to be a very smooth operating unit. After galvanizing, wire is loaded into our ever present bins or onto drum

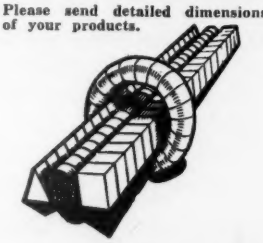
LARMUTH *Spiral Wrapping* MACHINES



are built to finest British engineering standards and are in use throughout the world for spiral wrapping of Motor Tyres, coils of Wire, Strip, etc., from 3" bore upwards. Also straight length Tubes, Bars, Rods, etc.

"BOUND" to get there safely.

Please send detailed dimensions of your products.



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SPECIALIZED ENGINEERING
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FOR
TWISTING • STRANDING • BUNCHING
Continuous Tension Control
For Precision-Quality

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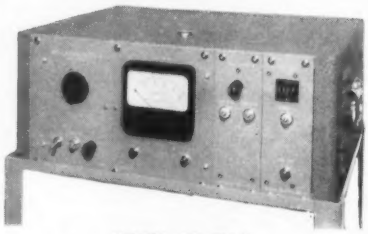
MORE EFFICIENT **WIRE SPARKING** ACHIEVED WITH

PESCHEL HV DC SPARKERS

- FAST: For wire speeds up to 4000 ft/min.
- EFFICIENT: 1" Electrode sufficient. Save floor space.
- ACCURATE: Registers *EVERY* fault. *(Impossible with 36" electrode)*
- NON-DESTRUCTIVE: No burning or marking of wire.
- SAFE: Non-lethal output (unlike AC Sparkers)



MODEL 10 CV-X
(Floor stands available also)

SELF-TESTING AND EASY MAINTENANCE—Sectionalized construction, supervisory circuits and panel indicators enable quick location of defective section, which unplugs for quick removal and replacement with spare. Factory carries spares earmarked for this equipment and available for immediate air express shipment to any place in the world.

USED BY LEADING INSULATED WIRE CONCERNS

Alphaduct Wire and Cable Co.	Hudson Wire Co.
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MEETS IPCEA • NEMA • ASTM • USAF • MIL • JAN and ALL OTHER STANDARDS

Send for information on this new, efficient sparker

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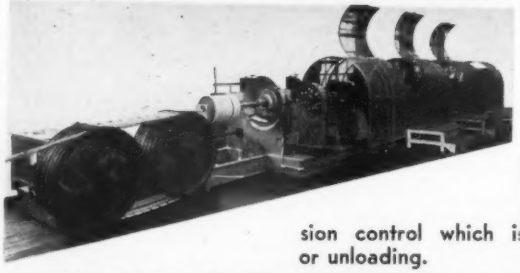
4-WIRE TWISTING MACHINES



CRADLE REELS
diameter 48"
overall width 31½".

FILLER HEAD 24 Packages 12" diameter by 12" Traverse with adjustable tension control which is not affected by loading or unloading.

SERVING HEAD AIMCO plate type flyer with six spindles accommodating yarn packages 6" diameter 4" traverse.

BINDING HEAD AIMCO plate type flyer with two spindles accommodating yarn packages 3" diameter 5" traverse.

Either type is driven thru clutch, variable speed device and Gilmer belts from the constant speed shaft.

TAPING HEAD is of the constant tension type and accommodates a pad 24" in diameter and up to 4" in width. It is driven thru clutch, variable speed device and Gilmer belts from the constant speed shaft.

CAPSTANS 6 groove 42" root diameter. Rates of lay from 3" to 50". Flyer speed 8 steps from 600 to 34 R.P.M. Handles large diameter wires on cradle reels.

An exceedingly efficient and versatile machine.

THE EDMANDS CO. 860 WELLINGTON AVE., CRANSTON 10, R. I.

containers for loading directly into the netting machine pay-off racks. Here again butt welding and drum loading gives uninterrupted operation of the netting machines that also have the packaging of their finished product done without machine stoppage. Netting is placed on pallets by the netting machine operators. It is moved to storage, into cars or onto trucks by fork truck. To conserve space 36" width netting is stored four pallets high. Fish trap netting is seasonal and requires room for wire storage and also quite an area for storage of finished product prior to shipment. Handling of this bulky product in a limited area consumes more man power per ton than other products.

★ ★ ★

Loading of bale tie wire, welded stucco netting wire, stitching wire stock, and market wire is boom hoist handled prior to unit loading into the pot anneal. Some of these products are single length 3500 lb. coils of wire that are transported on, and payed off of the annealing spider. These resulting finished products are usually palletized.

★ ★ ★

The plant wide placement of electric or air powered hoists is governed by inherent capabilities of either type. The placing of the hoists is as important as the proper selection of the equipment.

★ ★ ★

Our trucks will transport some 24,000,000 lbs. of wire per month or an average of 8 handlings for each finished product. Machine and hoist handling is difficult to average out. The simplest finished wire product in our plant will require some 10 handlings and 3 intermediate storages before the Shipping Department moves it out the door.

★ ★ ★

The maximum load or coil size during processing is a very important factor in economical operation. In my opinion, the biggest shot in the arm that wire mills have had in the past 20 years, handling and storage-wise, was the increase in weight of rod coils.

Those who have been able to use full weight coils or even larger welded units entirely through their processing have reduced costs through saving labor and increasing yields.

★ ★ ★

Constant vigilance and potent imaginations will always add to efficiency. The other fellow's handling and storage in his mill might not be up to that of your own shop, but, odds are that something he is doing could be applied to your mill. Our latest money saver was the use of piano movers equipment to reduce transportation damages to welded stucco netting.

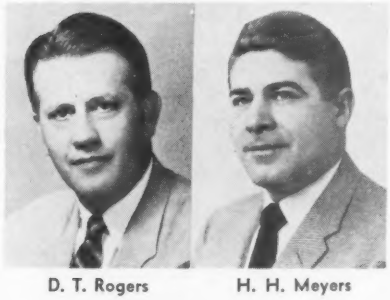
Wire Mill Finishes

(*Continued from page* 885)

producers in the wire industry, the Columbia-Geneva Steel Division of United States Steel is always happy to listen to the needs of the consumers and to provide various combinations of the factors affecting wire finishes to the maximum benefit of all concerned.

New England Bar Mill Opened by J&L

(*Continued from page* 900)



D. T. Rogers H. H. Meyers

Jones & Laughlin is in the midst of a four-year $313 million capital program of expansion and cost reduction and its production capacity will have increased 64% over that of 1946 when the program is completed in 1958.

DANFORTH

FIRST QUALITY—PROPERLY-GRADED

DIAMOND POWDERS

Will give you maximum • • •

Value • Service • Economy

For this you pay a little more in first cost, but you save in faster work, in superior die finish and in better wire drawn. DANFORTH POWDERS are uniform in purity, quality, grain shape and accuracy of grading.

COMPLETE RECLAIMING SERVICE

The DANFORTH PROCESS of reclaiming produces powders that are *guaranteed* to be 99% or better pure.

Write today for information on diamond powders.

C. W. DANFORTH COMPANY

P. O. Box 448 Established in 1912 Youngstown, Ohio

AUTOMATIC ELECTRIC

WIRE WELDING MACHINES

„Strecker-Auteldra"

Producing High Tensile Welds to Resist Subsequent Drawing

AUGUST STRECKER KG

Manufacturers of Electric Welding Machines

LIMBURG/LAHN • WEST GERMANY •

KO CO., INC

INDUSTRIAL IMPORTERS

Sole Distributor For The U.S.A.:

KURT ORBAN CO., INC., 34 EXCHANGE PLACE JERSEY CITY 2, N. J.

for extra tonnage
from your bar stock
and wire dies

coat with
BORAX 5 MOL.

Borax and Borax 5 Mol Offer Many Advantages as a Coating Material

Here is dust-free, granular material that is readily soluble in water and dries quickly. The residual film is tight yet pliable... won't flake off! Borax is safe to use, easy to handle, and non-irritating to the skin. You can feed stock faster and you get longer, more accurate performance from your dies.

Check these advantages of borax-coated stock:

- COMPATIBLE WITH DRAWING LUBRICANT
- BETTER WORKING CONDITIONS
- FASTER BUTT WELDING
- LONGER DIE LIFE
- LONGER STORAGE WITH SAFETY
- CLEANER TO HANDLE IN TRANSIT

Write to our Technical Department for further information

United States Borax & Chemical Corporation
PACIFIC COAST BORAX COMPANY DIVISION

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Los Angeles · New York · Chicago · Kansas City · Philadelphia · Cleveland

New Methods of Mill Packaging

(*Continued from page* 880)

Inexpensive, but sturdy, non-returnable racks are being constructed from 2 x 4 inch material for chain piling up to two ton of wire from mill to fabricator shipments. After the completion of the testing and bundling stage, the finished wire is chain piled on the racks. The rack is strapped to assure the coils from shifting. Keep in mind that when this rack is identified and strapped it is ready to be loaded in truck or rail. It does not have to be handled again as it would if it were on a mill rack. The racks can be loaded into a truck or rail car with less time and effort than if coils were handled as single bundles. Both producer and fabricator benefit in economy by the simplified handling of this package. A durable steel wire-rack for stocking wire products is expensive. There are periods when we have too many empties to take up valuable storage area. The answer to the fabricator is, burn the wooden ones and use the storage area. The costs of permanent steel racks can be applied to a piece of productive equipment, instead of facing the problem of where to store the empties.

★ ★ ★

Safety in packaging is an essential element. Take for instance a keg of nails. Probably the most commonly used wire product, and the ever present glass milk bottle formerly standing at the door, both now generally replaced by the carton.

★ ★ ★

These changes have eliminated many minor and major accidents. There need be no more deep scratches and puncture wounds from dipping the hand into the old keg where the top was knocked out and the nails that secured the top were left protruding than there is any need for the serious lacerations from the broken milk bottle.

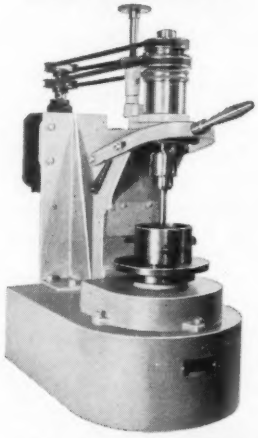
★ ★ ★

It is also obvious that in replacing these cylindrical packages that a considerable saving is effected in storage.

NEW!

DYKREX
"IT CORRECTS THE DIE"

Medium Duty Lapping or Ripping Machine



At A NEW LOW PRICE

Made of welded steel fabrication. Same quality construction as all Roos and Dykrex Wire Die Finishing Machinery.

We make a full line of Rippers, Lapping Machines, Drillers, Polishing Machines and Pin Grinders. Send for catalog—NOW

Manufactured by
DYKREX CORP.
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YOU NEVER KNOW

THE COST OF A TOOL UNTIL YOU HAVE TO *REPLACE IT!*

UNLIKE SOME TOOLS

CAREW CUTTING NIPPERS

don't have 1000 uses. They are made only for cutting wire.

CAREW NIPPERS will continue to do this year after year; cutting efficiently long after most tools have been junked.

MADE IN 4 SIZES
8", 10", 12", 14"

Jaws are made of hardened tool steel and are removable for sharpening.

STOCKED BY MOST MILL SUPPLY DEALERS

Made by

M. W. ROBINSON COMPANY

ROCKFALL, CONNECTICUT

There are several similar drum and pail type packaging methods constructed of fibreboard and steel, with similar advantages; some are non-returnable. Reduced reel investment, less storage space, no repair costs, no return freight costs, no bookkeeping, no cash deposits and tight enclosures eliminating deterioration in storage are factors favoring this type of package.

★ ★ ★

The steel pails are especially applicable for packaging brass, copper, steel, aluminum, stainless steel, welding, and soldering wires. Weights varying up to 100 lbs. The fibreboard drum is generally used for non-specialty wire commodities with capacities up to 600 pounds.

★ ★ ★

The fibreboard core that can be easily disposed of is adaptable to weights of a 1000 pound of spooled wire with the formerly mentioned advantages.

★ ★ ★

Everyone is aware that packaging wire on a reel is not a new method. The wooden reel is limited to certain slow speed applications. Light weight, sturdy, precision steel constructed reels are gradually filling this limitation gap.

★ ★ ★

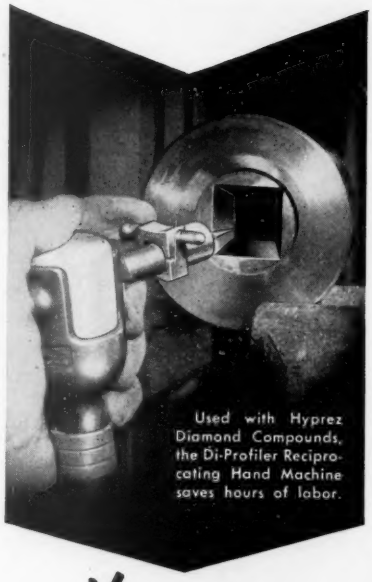
One very important advantage of the steel reel is that higher speeds in packaging and de-reeling can be obtained. Naturally, this factor is a cost saver. Another just as important factor is safety. Splinter proof, and balanced construction lessens the risks of injury from splinters and unbalanced reels flying off the spindle.

★ ★ ★

The many spooling operations in the wire industry require various sizes and shapes of wood and metal spools. Some manufacturers specialize in custom built construction for individual requirement.

★ ★ ★

The spool manufacturer is alert to the specialties needed in this field and are constantly striving to



Used with Hyprez Diamond Compounds, the Di-Profiler Reciprocating Hand Machine saves hours of labor.

You can save money, muscle, and finishing time with

THE Di-Profiler

FLEXIBLE SHAFT

RECIPROCATING HAND MACHINE

For grinding, filing, scraping, honing, lapping, polishing—the Di-Profiler saves hours of tedious hand labor. The speed of reciprocation can be varied from 0 to 100 strokes per second; the length of stroke is adjustable from 0 to ¼ inch.

Ask for a Free Demonstration or Technical Bulletin No. DW-87.

HYPREZ DIVISION

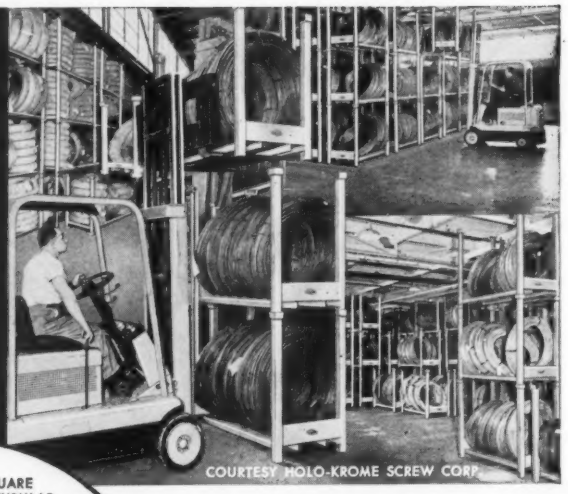
ENGIS EQUIPMENT CO.

431 S. Dearborn Street, Chicago 5, Illinois

JARKE

PORTABLE

WIRE COIL RACKS



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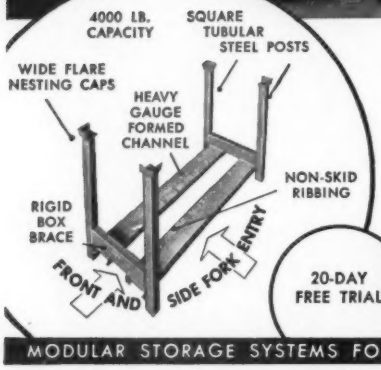

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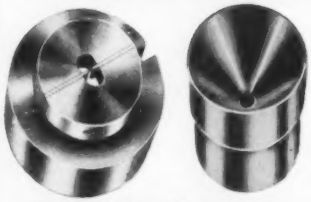

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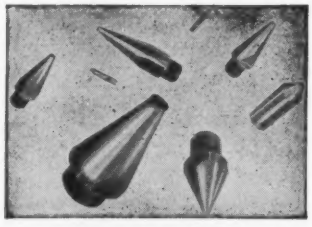

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★ ★ ★

Thus the urgent need for continued and diligent research for improved methods in this field.

What's New in Wire Straightening and Cutting

(*Continued from page* 894)

allow us to take advantage of the higher speeds. Combining these new developments in various ways will give us a line of machines that should about double the present production rates. The future of this machinery and that of the wire industry depends upon the development of new products and uses of wire and rod as well as our ingenuity in solving the problems of production.

New RHH-RHW Wire Produced

New Type RHH 90°C-RHW 75°C heat and moisture resistant, rubber insulated and fibrous covered wire and cable is now available from **National Electric Products Corp.**, Pittsburgh, Pa.

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Designed for general use in wet or dry locations, Type RHH-RHW wire and cable is included in the 1956 National Electrical Code. It is listed by Underwriters Laboratories, Inc., for 600 volt service in sizes 14 through 6 AWG.

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The insulation is Nepcozone Butyl, developed by the company for high voltage cable where its ozone and corona resistant properties are desired. This wire will find application in industrial plants and boiler rooms where heat and moisture may be present and where rubber insulation characteristics may be preferred.

Wire Association Pacific Coast Regional Meeting 1957

(*Continued from page* 878)

Mr. Barbata then introduced an unusual speaker with an unusual subject—**George W. Bunton,** Astronomer at the California Academy of Sciences, San Francisco. His talk proved highly entertaining and interesting. He described the purposes for which the satellite was being made and predicted that there would be inter-planetary space travel within forty years.

★ ★ ★

The dinner session concluded with the showing of a new color movie, "The Long Pull", through the courtesy of the Bethlehem Pacific Steel Corporation, produced recently for them. It was a splendid picture, depicting the manufacture of wire and the fabrication of wire into finished products. Excellent views of machines making these products were included.

★ ★ ★

The Planning, or Program, Committee is to be congratulated on the successful outcome of their efforts, especially since it involved a departure from the traditional one-day West Coast programs.

★ ★ ★

The judgment of the Committee that a heavier program with considerable weight given to a full technical session has been more than vindicated and the Directors and Officers of The Wire Association extend to each committee member their heartfelt appreciation.

Attendance List
Pacific Coast Regional Meeting
The Wire Association
June 13 & 14, 1957

Registration

ABRAMS, J. H., Manager
Central District
American Chemical Paint Co.
St. Joseph, Mo.

ALBRIGHT, L. W., Manager
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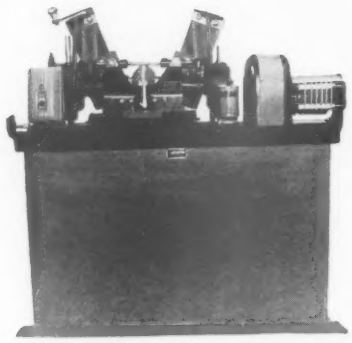

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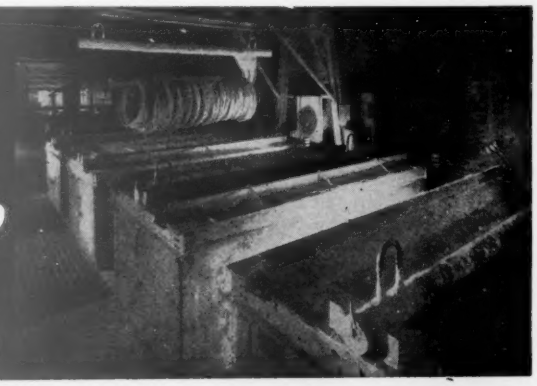

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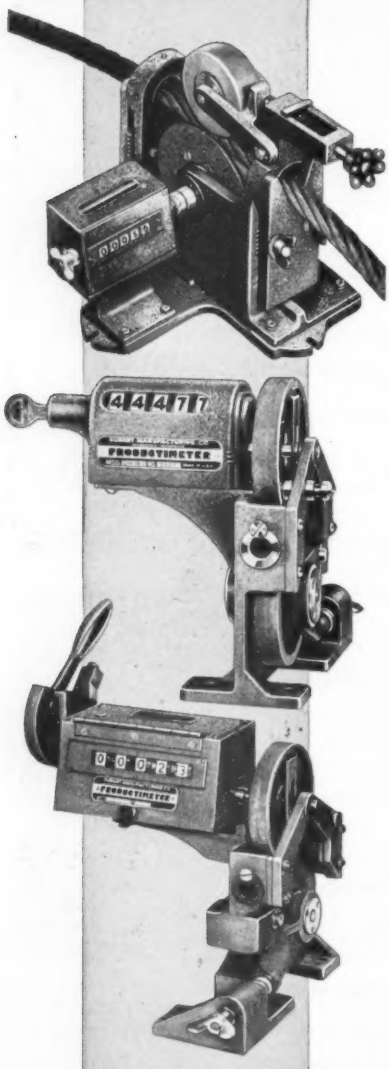

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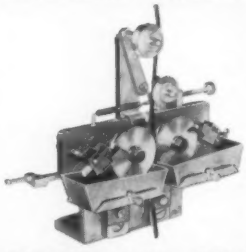

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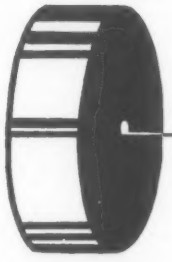

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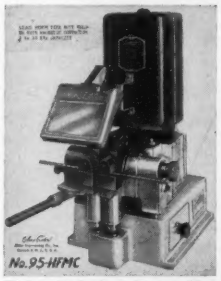

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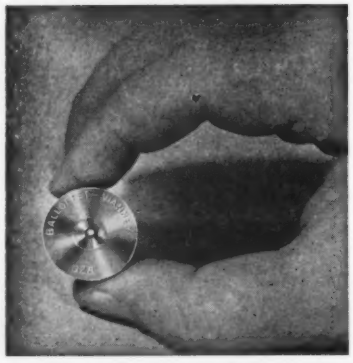

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Wire Drawing Machinery

(*Continued from page* 888)

mediate wire sizes, a 13-Die CIF Machine for the smaller range of intermediate wire sizes, and the 16-Die CF-IX Machine for the finer sizes of wire. Top finishing speeds on these machines range from 6000 to 7500-FPM, and in practically all cases, the machines are supplied with spoolers of various sizes.

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★ ★ ★

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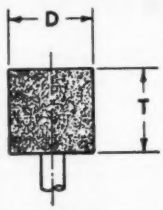

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★ ★ ★

Not too much development along this line has been done as yet for steel wire, but this is a field which can stand some further research.

Proceedings Pacific Coast Regional Meeting

(*Continued from page* 896)

Asked whether any development work had been done to put ferrous wire in 500 pound fibre drums, Mr. Migge said he understood it was being done in Eastern mills, but not by them, although it might be advisable. Some Western mills are using the drums for stainless, copper, welding and other types of wires. The questioner remarked that his company was using the drums for non-ferrous wires.

★ ★ ★

New Developments in Wire Drawing Machinery

The panel discussion covering this subject was led by **A. B. Krieder** of the **Bethlehem Pacific Coast Steel Corporation** as moderator of the meeting.

★ ★ ★

Mr. Daugherty was the first target for a question on how many men it would take to operate the bank of 16 machines referred to, including putting the wire on and stripping it from the machines, to which he replied that one man should be able to serve three machines, the wire coming off in 1000 pound coils. The intervals between stripping depended on wire sizes and speeds.

★ ★ ★

Mr. Rybak was asked whether they could build a straightener and cutter for the so-called "high-bond" bar used for reinforcement

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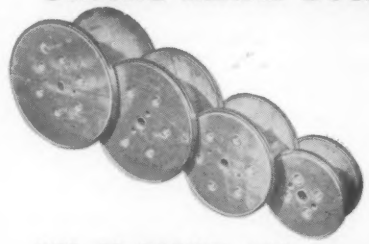

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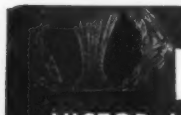
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and, if so, whether it was a roll machine. He stated they had made two for the Steel Company of Canada. This was for 5/8 and 3/4 inch bars of this type. The machines were standard models on which a few special adaptations had been made.

★ ★ ★

Another questioner wanted to know if on the reinforcing steel bar straightener there was any flaking off of the scale. To an affirmative answer, Mr. Rybak added that they have an exhaust hood over the straightener arbor to pick up loose scale and carry it away. Carbide dies are used, but some customers use stellite to puddle in the dies after they have become worn.

★ ★ ★

Asked whether the product was readily acceptable, he stated that at first they would not tolerate having the scale come off the reinforcing rod, as when they got through they had to size the rods since practically all the scale was coming off on the pre-sizer. Scale has to be knocked off to get the rod straight and now the trade is accepting the condition.

★ ★ ★

In the absence of further questions, Chairman Barbata adjourned the meeting at 5:15 P.M., expressing his appreciation to the speakers for their fine presentations.

★ ★ ★

The papers given in the two panel discussions are printed elsewhere in this issue and may be referred to in connection with the reading of these proceedings.

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Correction

In the article "The Extrusion of "Teflon" 6 Tetrafluoroethylene Resin for Wire Insulation" published in June, there were a number of omissions in some illustrations to which attention is called:

★ ★ ★

In Fig. 1 in the formula at the base there should have been minus signs between A_c and A_r and between A_l and A_w.

★ ★ ★

In Fig. 4 there should be a dash between R.R. and 1600.

★ ★ ★

In Fig. 7 at the bottom of the right hand column under "Ram Displacement Rate", the wording should read "cu.in./min."

★ ★ ★

In Fig. 10, upper right hand corner, the second line should read "Coating Thickness 0.010" and a dash goes between the words "Time" and "Seconds" at the bottom.

★ ★ ★

We regret that the line cuts did not reproduce clearly.

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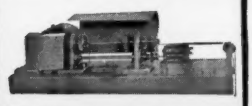
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On Page 658 of the June 1957 issue, at the end of the article entitled "IMPROVEMENTS IN STRANDING OF INSULATED WIRES"—we have been advised by the author of an error in the calculation of cost of labor, etc., as shown in Table III.

The corrected table, is published herewith at the request of the author.

Type of stranding machine	Value approx. francs /each	Interest and amort (5 years)	Km/year	Amort. Km	Without repairing			With repairing		
					Lab. Fr/Km	Total	Coeff.	Lab. Fr/Km	Total	Coeff.
With. Cage Vert.	1.300.000	325 000	2 940	111 ~~1140~~	137	248 ~~1247~~	1,08 ~~5,5~~	289	400 ~~1333~~	1,2 ~~4,2~~
With. Cage horizont.	6.200.000	1.560.000	1.800	863 ~~8600~~	423	1288 ~~8073~~	5,6 ~~40,0~~	556	1421 ~~8200~~	4,26 ~~27,5~~

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Sunbeam Corporation, (Industrial Furnace Division), Chicago, Illinois
Wilson, Lee, Engr. Co., Cleveland, Ohio

FURNACES—Heat Treating
Ajax Electric Company, Philadelphia, Pa.
Carl Mayer Corp., The, Cleveland, Ohio
Electric Furnace Co., Salem, Ohio
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Illinois
Wilson, Lee, Engr. Co., Cleveland, Ohio

FURNACES—Pot (Oil, Gas, Electric)
Ajax Electric Company, Philadelphia, Pa.
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Illinois

FURNACES—Resisting Heating, Strand
Electric Furnace Company, Salem, Ohio
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Illinois

FURNACES—Salt Bath
Ajax Electric Company, Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio

FURNACES—Strand Annealing
Electric Furnace Company, Salem, Ohio
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Illinois

GAUGES—Wire Diameter, Continuous
Industrial Gauges Corporation, West Englewood, N. J.

GALVANIZING EQUIPMENT—(See MACHINERY—Galvanizing Wire)

GEARMOTORS—
The Louis Allis Company, Milwaukee, Wisc.

GRINDERS—Roll
Norton Co., The, Worcester, Mass.

GUIDES—For Wire
Heany Industrial Ceramic Corp., New Haven, Conn.

GUIDE TIPS—For Extruding Machines (See NOZZLES)

HAMMERS—Nail Heading
Firth Sterling, Inc., Pittsburgh, Pa.
Pittsburgh Carbide Die Co., Monongahela, Pa.

HAMMERS—Swaging
Sjogren Tool and Machine Co., Auburn, Mass.

HOISTS—Electric Travelling
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio

INHIBITORS—Pickling
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

INKS—Printing, for Insulated Wire
Entwistle Manufacturing Corporation, Providence, R. I.
Gem Gravure Company. West Hanover, Mass.

INSULATING MATERIALS—
Bakelite Company Div. of Union Carbon & Carbide Corp., New York, N. Y.
duPont de Nemours Co., (Inc.), E. I., Polychemical Dept., Wilmington, Delaware
General Electric Company, Alkanex Wire Enamel Dept., Schenectady, N. Y.
Monsanto Chemical Company, Plastics Division, Springfield, Mass.
Plymouth Cordage Company, Plymouth, Mass.
Shawinigan Resins Corporation, Springfield, Mass.
U. S. Industrial Chemicals Company, Division of National Distillers & Chemical Products Corporation, New York, N. Y.
United States Rubber Company, Naugatuck Chemical Division, New York, N. Y.

INSULATING MATERIALS—Paper (For Electric Wire Cable)
Plymouth Cordage Company, Plymouth, Mass.

LACQUERING SYSTEMS—See MACH.—Lacquering Electric Wire

LAME—LAHN—
Montgomery Co., The, Windsor Locks, Conn.

LIME—
Warner Co., The. Philadelphia and Bellefonte, Pa.

LUBRICANTS—For Metal Cutting, Stamping and Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Magnuson Products Corporation, Brooklyn, N.Y.
Miller, R. H., Co., Inc.. Homer, N. Y.
Nopco Chemical Company, Harrison, N. J.
Rome Soap Mfg. Co., Rome, N. Y.
Standard Industrial Compounds Co., Frankfort, Ill.

LUBRICANTS—Wire Drawing
(See Compounds—Wire Drawing)

LUBRICANTS—Wire Rope
Swift & Co., Chicago, Ill.

MACHINERY—Armoring (Cable, Wire, Hose)
American Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc., (used), Pawtucket, R. I.

MACHINERY—Barbed Wire
Glader Wm., Machine Works, Chicago, Ill.
Wafios, Maschinenfabrik, Reutlingen, Wurtt, Germany

MACHINERY—Bobbin Winders
Cedar West Tool Company, Inc., New York, N. Y.

MACHINERY—Braiding
New England Butt Co., Providence, R. I.
Wardwell Braiding Machine Co., Central Falls, R. I.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Bunching
Cook Manufacturing Co., The, Paterson, N. J.
Edmands Company, The, Cranston, R. I.
Haskell-Dawes Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Bundling, Scrap
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Cable, Electric
American Insulating Mach'y Co., Phila., Pa.
Cook Mfg. Co., The, Paterson, N. J.
Haskell-Dawes Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Capstans (See Capstans and Machinery—Winding Wire)

MACHINERY—Centerless Grinding & Polishing
American Laubscher Corporation, New York, N. Y.

MACHINERY—Chain Making
Nilson, A. H. Machine Co., Shelton, Conn.
Wafios Maschinenfabrik, Reutlingen, Wurtt, Germany

MACHINERY—Closing Rope
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany.
Watson Machine Co., Paterson, N. J.

MACHINERY—Coiling Rod
Vaughn Mach'y Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Cold Heading
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Copper Wire Drawing
American Insulating Mach'y Co., Phila., Pa.
Cook Mfg. Co., The, Paterson, N. J.
Morgardshammer Mek Verstads A. B., Morgardshammer, Sweden.
National Mach'y Exch (Used), New York
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Covering Wire (See MACHINERY—Insulating Wire)

MACHINERY—Cutting
Eisler Engineering Company, Newark, N. J.
Lewis Machine Co., The, Cleveland, Ohio
Mettler Machine Tool, Inc., New Haven, Conn.
Patterson Machine, Geo. C., Co., Cleveland, Ohio

MACHINERY—Descaling Rod, Dry
Fisher Associates, New York, N. Y.
Herborn, Herborn, Germany

MACHINERY—Die Making
Boulin, Victor J., Inc., New York, N. Y.
Dykrex Corp., Roos Tool & Mfg. Div., Newark, N. J.
Firth Sterling, Inc., Pittsburgh, Pa.
Metallurgical Products Dept. of General Electric Co., Detroit
Wayne Wire Die Co., Hillside, N. J.

MACHINERY—Draw Benches
Morgan Construction Co., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Edging (See MACHINERY — Tandem Rolling and Edging Mills)

MACHINERY—Enameling
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Industrial Ovens, Inc., Cleveland, Ohio
Litzler, C. A., Co., Inc., Cleveland, Ohio
Michigan Oven, Company, Detroit, Mich.

MACHINERY—Extruding
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Royle, John, & Sons, Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

MACHINERY—Fence
Glader, Wm., Machine Works, Chicago, Ill.

MACHINERY—Flat Wire
Fenn Manufacturing Co., Newington, Conn.
Mettler Machine Tool, Inc., New Haven, Conn.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Forming Wire
Nilson, A. H. Machine Co., Shelton, Conn.
Wafios Maschinenfabrik, Reutlingen, Wurtt, Germany

MACHINERY—Galvanizing Wire
Vaughn Machinery Co., Cuyahoga Falls, O.
Wilson, Lee, Engr. Co., Cleveland, Ohio

MACHINERY—Gang Winders
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Mfg. Co., Wallingford, Conn.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Grinding
Norton Co., The, Worcester, Mass.

MACHINERY—Insulating Wire
American Insulating Mach'y Co., Phila., Pa.
Beard Machine Co., York, Pa.
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Litzler, C. A., Co., Inc., Cleveland, Ohio
Michigan Oven Company, Detroit, Mich.
New England Butt Co., Providence, R. I.
Pourtier Pere et Fils, Romainville (Seine), France
Royle, John & Sons, Paterson, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Labeling Electric Wire
Dewyer, Inc., Libertyville, Ill.

MACHINERY—Lacquering Electric Wire
American Insulating Mach'y Co., Philadelphia
Cook Mfg. Co., The, Paterson, N. J.
Industrial Ovens, Inc., Cleveland, O.
Michigan Oven Company, Detroit, Mich.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Looms, Wire Weaving
Cedar West Tool Company, Inc., New York, N. Y.
E. V. G., Richard Kleinhans, New York, N. Y.
Maschinen & Stahl A. G., c/o Richard Kleinhans, Zurich, Switzerland
Wafios Maschinenfabrik, Reutlingen, Wurtt., Germany

MACHINERY—Material Handling
(See Material Handling Equipment)

MACHINERY—Measuring Wire & Cable
Durant Mfg Co., Milwaukee, Wis.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
New England Butt Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Nail and Tack
Glader, Wm., Machine Works, Chicago, Ill.
National Mach'y Exch. (Used), New York, N. Y.
Wafios, Maschinenfabrik, Reutlingen, Wurtt., Germany

MACHINERY—Packaging Wire
Coulter & McKenzie Machine Co., Bridgeport, Conn.

MACHINERY—Pin Making

MACHINERY—Plating
Hodge Bros. Machine Shop, Ossining, N. Y.
Universal Industrial Equipment Co., Secaucus, N. J.

MACHINERY—Pointing
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York,
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Polishing Asbestos Wire
Beard Machine Co., York, Pa.

MACHINERY—Printing on Electric Wire
Entwistle Manufacturing Corporation, Providence, R. I.
Gem Gravure Company, West Hanover, Mass.
Gillies, Duncan M. Co., Inc., Boylston, Mass.

MACHINERY—Re-Spooling
Bartell Machine-Tool Corporation, Rome, N. Y.
Colbourne Machine Company, Winsted, Conn.
Emory Company, Robert J., Newark, N. J.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Hodge Bros. Machine Shop, Ossining, N. Y.
National Mach'y Exch. (Used), New York N. Y.
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y Inc. (used) Pawtucket, R. I.

MACHINERY—Rod Mill
Fenn Manufacturing Co., Newington, Conn.
Morgan Construction Co., Worcester, Mass.

MACHINERY—Rolling Mill
Fenn Manufacturing Co., Newington, Conn.
Morgan Construction Co., Worcester, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Rubber Insulating
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Litzler, C. A., Co., Inc., Cleveland, Ohio
Royle, John & Sons, Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Serving
Pourtier Pere et Fils, Romainville (Seine), France
Wardwell Braiding Machine Co., Central Falls, R. I.

MACHINERY—Spark Testing
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Peschel Electronics, Inc., New Rochelle, N. Y.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Spring Making
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Wafios, Maschinenfabrik, Reutlingen, Wurtt., Germany

MACHINERY—Staple
Nilson, A. H. Machine Co., Shelton, Conn.
Wafios, Maschinenfabrik, Reutlingen, Wurtt., Germany

MACHINERY—Straightening & Cutting
Breitenbach, Wilhelm, Unna, Germany
Lewis Machine Co., The, Cleveland, Ohio
Mettler Machine Tool Co., New Haven, Conn.
National Mach'y Exch. (Used), New York, N. Y.
Patterson Machine, Geo. C., Co., Cleveland, Ohio
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Stranding
Bartell Machine-Tool Corporation, Rome, N. Y.
Godderidge Ste., Houilles, (Seine-et-Oise), France
Haskell-Dawes Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Superior Tool & Manufacturing Company, Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Stripping Electric Wire & Cable
Burdwood, Howard A., Inc., Portland, Maine

MACHINERY—Swaging
Fenn Manufacturing Co., Newington, Conn.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Take-Up and Pay-Out
American Insulating Mach'y Co., Phila., Pa.
Breitenbach, Wilhelm, Unna, Germany
Colbourne Machine Company, Winsted, Conn.
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Fenn Manufacturing Co., Newington, Conn.
Industrial Ovens, Inc., Cleveland, Ohio
Litzler, C. A., Co., Inc., Cleveland, Ohio
Pourtier Pere et Fils, Romainville (Seine) France
Standard Mill Supply Co., Pawtucket, R. I.
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Taping
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Pourtier Pere et Fils, Romainville (Seine), France
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Testing Magnet Wire Coatings for Pin Holes
Federal Mfg. Co., Wallingford, Conn.
Peschel Electronics, Inc., New Rochelle, N. Y.

MACHINERY—Testing, Physical
Scott Testers, Inc., Providence, R. I.

MACHINERY—Tinning Wire
American Insulating Mach'y Co., Phila., Pa.
Bartell Machine-Tool Corporation, Rome, N. Y.
Cook Manufacturing Co., The, Paterson, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Universal Industrial Equipment Co., Secaucus, N. J.

MACHINERY—Tinsel Rolling Mills
American Insulating Mach'y Co., Phila., Pa.

MACHINERY—Trolley Wire
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Tube Mill, Cold Drawing
Mettler Machine Tool, Inc., New Haven, Conn.

MACHINERY—Turks Head
Fenn Manufacturing Co., Newington, Conn.

MACHINERY—Twinning
(See Mach.—Bunching)

MACHINERY—Twisters, Wire
Cook Manufacturing Co., The, Paterson, N. J.
Edmands Company, The, Cranston, R. I.
Haskell-Dawes Machine Co., Philadelphia, Pa.

MACHINERY—Used
National Machinery Exchange, New York, N. Y.
Wire & Textile Machy., Inc., Pawtucket, R. I.

MACHINERY—Welded Wire Mesh
E. V. G., Richard Kleinhans, New York, N. Y.
Maschinen & Stahl A. G., c/o Richard Kleinhans, Zurich, Switzerland

MACHINERY—for Wire Welding
(See WELDERS—Butt and Spot and Machinery —Welding Wire Fabrics)

MACHINERY—Winding Wire
Emory Company, Robert J., Newark, N. J.
Federal Manufacturing Company, Wallingford, Conn.
Fenn Manufacturing Co., Newington, Conn.
New England Butt Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Drawing
Breitenbach, Wilhelm, Unna, Germany
Cook Manufacturing Co., The, Paterson, N. J.
Coulter & McKenzie Machine Co., Bridgeport, Conn.
Federal Mfg. Co., Wallingford, Conn.
Fenn Mfg. Co., Newington, Conn.
Herborn, Herborn, Germany
Hodge Bros. Machine Shop, Ossining, N. Y.
Morgan Construction Co., Worcester, Mass.
Morgardshammer Mek Verstads AB, Morgardshammer, Sweden
National Mach'y Exch. (Used), New York, N. Y.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Superior Tool & Manufacturing Company, Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Wire Forming
National Mach'y Exch. (Used), New York, N. Y.
Nilson, A. H. Machine Co., Shelton, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

MACHINERY—Wire Rope
New England Butt Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Watson Machine Co., Paterson, N. J.

MACHINERY—Wrapping with Paper
Larmuth (1947) Ltd., Swinton, England
Terkelsen Machine Co., Boston, Mass.

MANDRELS—Extrusion
Bartell Machine-Tool Corporation, Rome, N. Y.

MATERIAL HANDLING EQUIPMENT—
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, O.

MOTORS—Electric, A.C. & D.C.
The Louis Allis Company, Milwaukee, Wisc.

NAIL TOOLING—Tungsten Carbide
Firth Sterling, Inc., Pittsburgh, Pa.
Pittsburgh Carbide Die Co., Monongahela, Pa.

NAILS—Wire
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Sheffield Steel Corp., Kansas City, Mo.
Wickwire Brothers, Inc., Cortland, N. Y.

NIPPERS—Wire Cutting
Robinson, M. W. Co., Rockfall, Conn.

NOZZLES—For Extruding Machines
Wire Tool Div., Bridgeport Jig Boring Co., Bridgeport, Conn.

OVENS—Cable Lacquering and Enameling
American Insulating Mach'y Co., Phila., Pa.
Carl Mayer Corp., The, Cleveland, Ohio
Colbourne Machine Company, Winsted, Conn.
Industrial Ovens, Inc., Cleveland, Ohio
Litzler, C. A., Co., Inc., Cleveland, Ohio
Michigan Oven Company, Detroit, Mich.

OVENS—Rod Bakers
Carl Mayer Corp., The, Cleveland, Ohio

OVENS—Welding Rod Coating
Carl Mayer Corp., The, Cleveland, Ohio
Industrial Ovens, Inc., Cleveland, Ohio
Litzler, C. A., Co., Inc., Cleveland, Ohio

PAILS—Packaging
(See Drums—Wire Packaging)

PAINT BONDING CHEMICALS—
American Chemical Paint Co., Ambler, Pa.

PAINTS—Heat Resisting
American Chemical Paint Co., Ambler, Pa.

PAPER—Creped Wrapping
Arkell Safety Bag Company, New York, N. Y.
National Waterproof Papers, Inc., Beverly, N. J.
Rinkle, Krinkle Paper Co., Inc., Boston, Mass.
Terkelsen Machine Co., Boston, Mass.

PAPER—For Coil Wrapping and Corrosion Prevention
Arkell Safety Bag Company, New York, N. Y.
National Waterproof Papers, Inc., Beverly, N. J.
Rinkle, Krinkle Paper Co., Inc., Boston, Mass.
Terkelsen Machine Co., Boston, Mass.

PAPER—Insulating
Plymouth Cordage Company, Plymouth, Mass.

PATENT—ATTORNEYS—
Lancaster, Allwine & Rommel, Washington, D. C.

PAY-OUT SYSTEMS—
(See MACHINERY—Take-Up & Pay-Out)

PHOSPHATE COATING CHEMICALS
(See COMPOUNDS—Phosphate Coating)

PICKLING COMPOUNDS—
See (Inhibitors—Pickling)

PLASTICIZERS—
Monsanto Chemical Company, Plastics Division, St. Louis, Mo.
Pittsburgh Coke & Chemical Co., Pittsburgh, Pa.

PLASTICS COMPOUNDING—Custom
Plandex Corporation, Downingtown, Pa.

PLASTICS—for Wire Insulation
Bakelite Company Div. of Union Carbon & Carbide Corporation, New York, N. Y.
duPont de Nemours Co., (Inc.), E. I., Polychemical Dept., Wilmington, Delaware
Monsanto Chemical Company, Plastics Division, Springfield, Mass.
Plandex Corporation, Downingtown, Pa.
Shawinigan Resins Corporation, Springfield, Mass.
U. S. Industrial Chemicals Company, Division of National Distillers & Chemical Products Corporation, New York, N. Y.
United States Rubber Company, Naugatuck Chemical Division, New York, N. Y.

POTS—Lacquer
Industrial Ovens, Inc., Cleveland, Ohio

PRINTING WHEELS—for Electric Wire
Entwistle Manufacturing Corporation, Providence, R. I.
Gillies, Duncan M. Co., Inc. Boylston, Mass.

PULLERS AND GRIPS—For Wire
Morgan Construction Co., Worcester, Mass.
Scudder, E. J. Fdry. & Mach. Co., Trenton, N. J.
Sjogren Tool and Machine Co., Auburn, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

PUMPS—Molten Metal
Fisher Associates, New York, N. Y.

RACKS—Wire Storage
Jarke Manufacturing Co., Chicago, Illinois

REEL AND TENSION STANDS—
Industrial Ovens, Inc., Cleveland, Ohio
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Mill Supply Co., Pawtucket, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.

REEL CRUTCHES—
Watson Machine Co., Paterson, N. J.

REELS & SPOOLS—Aluminum Alloy
Acrometal Products, Inc., Minneapolis, Minn.
Hubbard Spool Co., Garrett, Ind.
Wardwell Braiding Machine Co., Central Falls, R. I.

REELS & SPOOLS—Annealing and Stranding
Acrometal Products, Inc., Minneapolis, Minn.
American Pulley Company The, Philadelphia, Pa.
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Garrett, Ind.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Republic Steel Corp., Pressed Steel Div., Cleveland, Ohio

REELS—Metal Bound
Durkee Mfg. Co., Inc., Pine River, Minn.
Hubbard Spool Co., Garrett, Ind.
McCaskie, Inc., William, Westport, Mass.
Strand-Buffalo Corporation, North Tonawanda, N. Y.

REELS—Plywood
Carris Reels, Inc., Rutland, Vt.
Hubbard Spool Co., Garrett, Ind.
McCaskie, Inc., William, Westport, Mass.
Nelson Company, The, Baltimore, Md.
Strand-Buffalo Corporation, North Tonawanda, N. Y.

REELS & SPOOLS—Steel (All Types)
Acrometal Products, Inc., Minneapolis, Minn.
American Pulley Company The, Philadelphia, Pa.
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Garrett, Ind.
Masonware Company, East Providence, R. I.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Republic Steel Corp., Pressed Steel Div., Cleveland, Ohio
Wardwell Braiding Machine Co., Central Falls, R. I.

REELS—Wire Mill
Acrometal Products, Inc., Minneapolis, Minn.
American Pulley Company The, Philadelphia, Pa.
Apco Mossberg Co., Attleboro, Mass.
Bridge Mfg. Co., The, Hazardville, Conn.
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co. Inc., Pine River, Minn.
Hubbard Spool Co., Garrett, Ind.
Masonware Company, East Providence, R. I.
McCaskie, Inc., William, Westport, Mass.
Mettler Machine Tool, Inc., New Haven, Conn.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Nilson, A. H. Machine Co., Shelton, Conn.
Republic Steel Corp., Pressed Steel Div., Cleveland, Ohio
Wardwell Braiding Machine Co., Central Falls, R. I.

REELS & SPOOLS—Wood
American Woodworking Co., Chicago, Ill.
Bridge Mfg. Co., The, Hazardville, Conn.
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co. Inc., Pine River, Minn.
Hubbard Spool Co., Garrett, Ind.
McCaskie, Inc., William, Westport, Mass.
Nelson Company, The, Baltimore, Md.
Strand-Buffalo Corporation, North Tonawanda, N. Y.

REFRACTORIES—High Temperature
Norton Company, Worcester, Mass.

ROD BAKERS—
(See OVENS—Rod Bakers)

RODS—Aluminum
Aluminum Company of America, Pittsburgh, Pa.

RODS—Stainless Steel
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Pittsburgh Steel Co., Pittsburgh, Pa.

RODS—Wire—Non-Ferrous
Aluminum Company of America, Pittsburgh, Pa.
Platt Bros. & Co., The, Waterbury, Conn.
Scovill Mfg. Co., Waterbury, Conn.
Seymour Mfg. Co., Phosphor Bronze Div., Seymour, Conn.

RODS—Steel
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Sheffield Steel Corp., Kansas City, Mo.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

ROPE—Wire
Bethlehem Steel Co., Bethlehem, Pa.
Roebling's, John A. Sons Corp., Trenton, N. J.

RUST PROOF COMPOUNDS—
(See COMPOUNDS—RUST Preventing)

RUST REMOVING COMPOUNDS—
(See COMPOUNDS—RUST Preventing)

SATURATION SYSTEMS—
Industrial Ovens, Inc., Cleveland, Ohio
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y Inc. (used) Pawtucket, R. I.

SOAPS—Industrial and Wire Drawing
(See COMPOUNDS—Wire Drawing)

SPOOLS—Plastic
Hubbard Spool Company, Garrett, Indiana
Standard Mill Supply, Co., Pawtucket, R. I.

SPOOLS—Stamped Metal for Retail Wire Sales
Masonware Company, East Providence, R. I.

STAMPINGS—Steel
Acrometal Products, Inc., Minneapolis, Minn.
Mossberg Pressed Steel Corp., Attleboro, Mass.

STOCK STORAGE SYSTEMS
Jarke Manufacturing Co., Chicago, Illinois

STRIP—Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Roebling's, John A. Sons Corp., Trenton, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

TABLES—Press Feeding
Jarke Manufacturing Co., Chicago, Illinois

TANKS—Compound
Watson Machine Co., Paterson, N. J.

TESTERS—INSULATION
(See MACHINERY—Spark Testers)

TESTING EQUIPMENT
(See MACHINERY Testing, Physical and Diameter Testing)

TINSEL—Electric Conductor
Montgomery Co., The, Windsor Locks, Conn.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

TINSEL WIRE—Resistance, Lame, Decorative Cords Thread—Bare Copper Silver and False Gold Coated, etc.
(See TINSEL—Electric Conductor)

TOOLS—Nail Machine
Pittsburgh Carbide Die Co., Monongahela, Pa.

TOOLS—Wire Cutting
Porter, H. K., Inc., Somerville, Mass.

TRAMRAIL SYSTEMS—
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

TRANSMISSIONS—Variable speed (See Adjustable Speed Drives)

TRAVERSES & DRUMS—For Reels
(See Drums & Traverses)

TRAVERSE MECHANISMS—
Apco Mossberg Co., Attleboro, Mass.
Bartell Machine-Tool Corporation, Rome, N. Y.
Emory Company, Robert J., Newark, N. J.
Hodge Bros. Machine Shop, Ossining, N. Y.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

VARNISHES & LACQUERS—for Electric Wire
General Electric Company, Alkanex Wire Enamel Dept., Schenectady, N. Y.
Shawinigan Resins Corporation, Springfield, Mass.

VULCANIZING PANS AND EQUIPMENT—
American Insulating Mach'y Co., Phila, Pa.
Litzler, C. A., Co., Inc., Cleveland, Ohio
Mossberg Pressed Steel Corp., Attleboro, Mass.

WELDERS—Spot and Butt and Welding Wire Fabrics
Eisler Engineering Corp., Newark, N. J.
Micro Products Co., Chicago, Ill.
Strecker, August, K.G., Limburg/Lahn, W. Germany

WHEELS—for Printing on Electric Wire
Gem Gravure Company, West Hanover, Mass.

WIRE—Aluminum
Aluminum Company of America, Pittsburgh, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Malin & Co., The, Cleveland, Ohio
National Standard Company, Niles, Mich.
Scovill Mfg. Co., Waterbury, Conn.
United Wire & Supply Corporation, Providence, R. I.

WIRE—Ball
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

WIRE—Barbed
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

WIRE—Brass and Bronze
Chase Brass & Copper Co., Waterbury, Conn.
Scovill Mfg. Co., Waterbury, Conn.
Seymour Mfg. Company, Phosphor Bronze Div., Seymour, Conn.
United Wire & Supply Corporation, Providence, R. I.

WIRE—Cadmium
Stamford Processing Co., Peekskill, N. Y.

WIRE—Cast
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Cold Heading
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Crucible Steel Co. of America, Pittsburgh, Pa.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Scovill Mfg. Co., Waterbury, Conn.
Sheffield Steel Corp., Kansas City, Mo.
United Wire & Supply Corporation, Providence, R. I.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Copper
Chase Brass & Copper Co., Waterbury, Conn.
United Wire & Supply Corporation, Providence, R. I.

WIRE—For Electrical Conductors
United Wire & Supply Corporation, Providence, R. I.

WIRE—Flat, Fine
Montgomery Co., The, Windsor Locks, Conn.
National Standard Company, Niles, Mich.
United Wire & Supply Corporation, Providence, R. I.
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Galvanized
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
National Standard Company, Niles, Mich.
Roebling's, John A. Sons Corp., Trenton, N. J.
Sheffield Steel Corp., Kansas City, Mo.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—High Carbon
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

WIRE—Manufacturers
Aluminum Company of America, Pittsburgh, Pa.
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Crucible Steel Co. of America, Pittsburgh, Pa.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
National Lock Washer Company, The, Newark N. J.
National Standard Company, Niles, Mich.
Pittsburgh Steel Co., Pittsburgh, Pa.
Porter Company, Inc., H. K., Riverside Alloy Metal Division, Prospect Park, Pa.
Roebling's, John A., Sons Corp., Trenton, N. J.
Scovill Mfg. Co., Waterbury, Conn.
Seymour Mfg. Company, Phosphor Bronze Div., Seymour, Conn.
Sheffield Steel Corp., Kansas City, Mo.
United Wire & Supply Corporation, Providence, R. I.
U. S. Steel Corp., N. Y., N. Y.
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Metalizing
Stamford Processing Co., Peekskill, N. Y.

WIRE—Music
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Malin & Co., The, Cleveland, Ohio
National Standard Company, Niles, Mich.
Worcester Wire Works Div., National-Standard Company, Worcester, Mass.

WIRE—Needle
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

WIRE—Nickel Alloy
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.

WIRE—Nickel Silver and Phosphor Bronze
Chase Brass & Copper Co., Waterbury, Conn.
Malin & Co., The, Cleveland, Ohio
Porter Company, Inc., H. K., Riverside Alloy Metal Division, Prospect Park, Pa.
Seymour Mfg. Co., Phosphor Bronze Div., Seymour, Conn.
United Wire & Supply Corporation, Providence, R. I.

WIRE—Oil Tempered
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Roebling's, John A., Sons Corp., Trenton, N. J.
Sheffield Steel Corp., Kansas City, Mo.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Special Shapes
Continental Steel Corp., Kokomo, Ind.
Crucible Steel Co. of America, Pittsburgh, Pa.
National Lock Washer Company, The, Newark, N. J.
Porter Company, Inc., H. K., Riverside Alloy Metal Division, Prospect Park, Pa.
United Wire & Supply Corporation, Providence, R. I.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Spring
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo. Ind.
Crucible Steel Co. of America, Pittsburgh, Pa.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
National Standard Company, Niles, Mich.
Pittsburgh Steel Co., Pittsburgh, Pa.
Porter Company, Inc., H. K., Riverside Alloy Metal Division, Prospect Park, Pa.
Roebling's John A., Sons Corp., Trenton, N. J.
Sheffield Steel Corp., Kansas City, Mo.
United Wire & Supply Corporation, Providence, R. I.
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Stainless Steel
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Crucible Steel Co. of America, Pittsburgh, Pa.
Firth Sterling, Inc., Pittsburgh, Pa.
National Lock Washer Company, The, Newark, N. J.
National Standard Company, Niles, Mich.
Pittsburgh Steel Co., Pittsburgh, Pa.
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

WIRE—Steel—Also Coppered and Galvanized Steel
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Crucible Steel Co. of America, Pittsburgh, Pa.
Continental Steel Corp., Kokomo, Ind.
Johnson Steel & Wire Co., Inc., Worcester Mass.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
National Standard Company, Niles, Mich.
Pittsburgh Steel Co., Pittsburgh, Pa.
Porter Company, Inc., H. K., Riverside Alloy Metal Division, Prospect Park, Pa.
Roebling's, John A., Sons Corp., Trenton, N. J.
Sheffield Steel Corp., Kansas City, Mo.
U. S. Steel Export Co., New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Straightening and Cutting
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
United Wire & Supply Corporation, Providence, R. I.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Zinc
Platt Bros. & Co., The, Waterbury, Conn.
Stamford Processing Co., Peekskill, N. Y.

WOOD—for Guide, Rolls, Bushings, Wear Parts, etc.

WRAPPING PAPER—Creped
(See PAPER—Creped Wrapping)

YARN TESTERS—
Scott Testers, Inc., Providence, R. I.

The WATSON MACHINE COMPANY

ESTABLISHED 1845

PATERSON 3, NEW JERSEY, U. S. A.

ELECTRICAL WIRE AND CABLE, WIRE ROPE, CORDAGE AND MASTICATING MACHINERY MANUFACTURERS

WATSON

PLANETARY STRANDERS. Three types, many sizes, for all duties, geared or ring backturn, main rotor shaft or roller support. "Shaftless" cradles.

RIGID FRAME STRANDERS "RH." Horizontal, overhung spindle designs. Ball bearing main rotor shaft support, no support rollers.

TUBULAR STRANDERS "TH." High speed type in all sizes. Patented Boat cradles and Tungsten Carbide guide system. Rotor and layhead electric stops.

TUBULAR STRANDERS "VL." New design, safe extra high speeds. Quick loading. "Shaftless" no loose parts cradles.

CABLERS. Planetary and high speed "HH" designs.

CLOSERS. Planetary, Rigid Frame and High Speed Types for Wire Rope and Electric Cables.

WATSON

BUNCHERS.

VERTICAL Minimum Floor Space Double-Twist Types "V-7" 250 # Cap. V-10 500 & 1000 # Cap.

ARMORING MACHINES. Complete with planetary wire or metal tape heads.

JUTERS. 36 or 48 cop and to 6-inch cable passage.

SERVING HEADS. Concentric and eccentric, many designs, for threads, asbestos, etc.

TAPING HEADS. Many types and sizes. For metallic and non-metallic tapes. Eccentric, single and double-concentric. Patented uniform torque tape brake.

COMPOUNDING AND SATURATING TANKS. Many types and sizes.

CHALK, MICA AND OTHER POWDER APPLIERS. "Wet and Dry" types in a variety of designs and sizes.

CAPSTAN SECTIONS. Single tapered wheels to 10 foot dia. with standard single or double shoe, or ball bearing ring fleeters. Double grooved types to 96 inch dia. For heaviest duty and highest haul pulls. Many sizes and designs.

TRACTOR CAPSTANS. Available in two types with sizes to suit many applications.

LET-OFF. Manual, mechanical, hydraulic, and electric motor lift types and "shaftless" designs to 120-inch 30-ton sizes.

GANG SPOOLERS. Table and Floor types in many sizes and designs.

REWINDERS AND COILERS. All motorized, for warehouse and shipping use.

CAPSTAN TAKEUPS. Single and in multiples.

HEAVY DUTY TAKEUPS. "Shaftless" in many designs and sizes to 120"-30-ton. Mechanical lift, hydraulic lift, motorized lift, incline frame, and other types. Line shaft, electric, and hydraulic drives. Foot treadle, electric switch, pneumatic, hydraulic, and mechanical controls.

CONTINUOUS TAKEUPS. Double reel designs, constant tension, wide speed range to cover all Continuous Vulcanizing and plastic Extruding takeup requirements.

TAKEUP TRANSMISSIONS. Heavy Duty, Type "D." Combines two-speed transmission, manual slack-takeup drive, and multiple-disc-in-oil friction mechanism in one compact unit. Now available in two sizes.

AUTOMATIC TRAVERSES. Many sizes and arrangements. Wide lay range. Designs cover range from fine wire to 6" cable and wire rope. Fully automatic and disconnectible for manual operation. Suitable and widely used for replacement of inadequate mechanism on older takeups.

VULCANIZERS. Cavity and Plate "Patch" units. Mechanically or pneumatically operated. Available from stock with or without dies.

MOLDED SHEAVES. Low cost, light weight Bakelite sheaves 11" O.Dia. x 8" groove Dia. Available in a variety of colors.

TESTING MACHINES. Impact, Torsion, Bend and Endurance types.

MEASURING MACHINES. For linear measurement. Offered in a variety of sizes and arrangements.

REEL CRUTCHES. For turning very large and heavy reels. Widely used in warehouses, shipping rooms, by railroads, steamship lines and wherever reel handling is a problem. Available from stock.

CABLE PLANT AND WIRE ROPE MILL EQUIPMENT. All manners of special and miscellaneous designs for general and special purpose work too numerous for listing but on which inquiries are invited.

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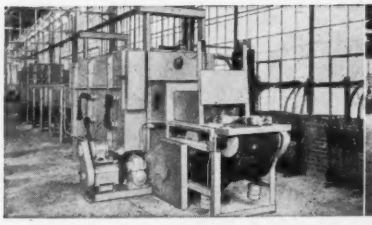
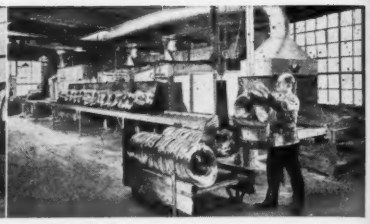
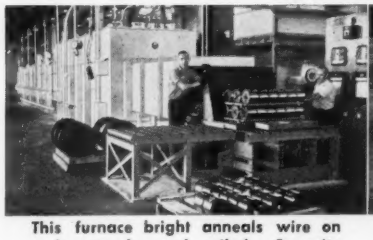


EF belt conveyor furnace bright annealing coiled alloy steel and non-ferrous wire.



EF continuous roller rail pusher furnace, bright anneals large reels and coils of wire.

designed engineered and

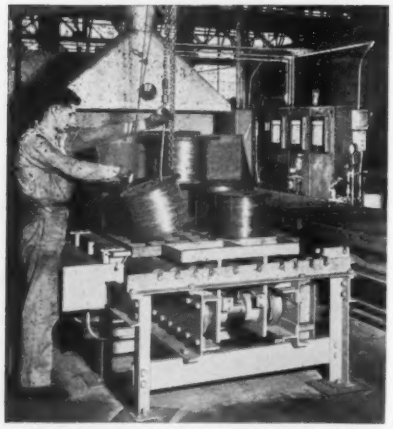


This furnace bright anneals wire on reels, spools, and coiled. Capacity 4000 lbs. per hr.

Stainless steel wire is bright annealed continuously in these EF multiple tube furnaces.

Specially Built

to meet the WIRE INDUSTRY'S requirements



Charging end of EF special atmosphere bulkhead pusher furnace; bright anneals copper and copperweld wire and clean anneals brass wire. Capacity 4000 lbs. per hr.

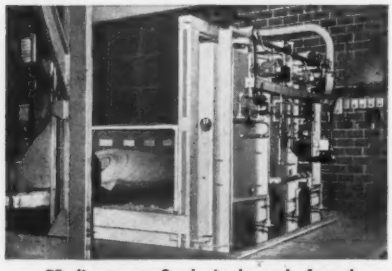
• We build production furnaces for heat processing all kinds of wire, rod, or other products — in any shape or form.

Years of practical experience in designing and building successful heat treating equipment for the wire industry enable us to furnish the best type of equipment for any purpose — and to produce the results required.

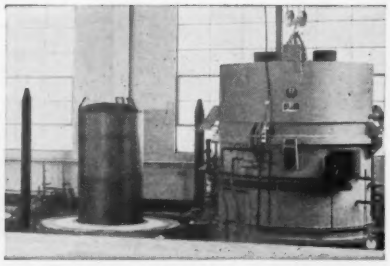
Shown here are 8 more production installations we made in prominent wire plants. We receive many repeat orders.

Submit your production furnace problems to experienced EF engineers — it pays.

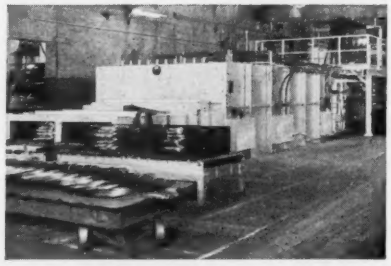
THE ELECTRIC FURNACE CO.
GAS FIRED, OIL FIRED AND ELECTRIC FURNACES FOR ANY PROCESS PRODUCT OR PRODUCTION
Salem - Ohio
Canadian Associates • CANEFCO LIMITED • Toronto 1, Canada



EF direct gas fired, single end, forced circulation hearth type annealing furnace with gantry crane for handling large coils of cupro nickel wire and brass rod.



EF direct gas fired bell type furnace with retorts and 4 forced circulation bases, used for bright annealing both ferrous and non-ferrous flat coiled wire.



EF special atmosphere continuous bright annealing furnace in which the wire is conveyed through the various zones on two parallel rows of bulkhead type trays.

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an-
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